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JALT Editorial 5(1): Higher education in an age of war

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Introduction

Amongst the numerous contributions in this issue of JALT, there is an interview with Stephen Brookfield that focuses on power. The interview was conducted in March, when Russia's invasion of Ukraine was only a few weeks old. Although the interviewers (Jürgen Rudolph and Shannon Tan) were tempted to ask Stephen Brookfield about power in the context of autocrats such as Putin, we resisted that temptation as we did not want to stray away too far from our core topic of power in higher education. However, upon further reflection, we have decided that this editorial must to a small extent address Russia's war in Ukraine, as it has quickly become one of the most important events in the 21st century.

The war in Ukraine is controversial. Although it is the most extensively documented conflict ever, it is difficult to discern what is real, fictitious or from a state misinformation campaign. In the battle of spinning media narratives, the truth may easily become a casualty. It has been reported (Rainsford, 2022) that the Russian media and public are not allowed to use the word 'war'. This state propaganda somewhat echoes French postmodernist philosopher Baudrillard's (1995) problematic perspective that there was no Gulf war. The current war is taking an enormous toll on Ukraine, with millions of people internally displaced, millions of especially women and children having fled the country, thousands killed, destroyed infrastructure and levelled cities. It also has other unintended catastrophic consequences: limited Russian and Ukrainian food exports raise a spectre of a global food shortage, mass impoverishment and political unrest.

The war in Ukraine and the battle over the accuracy and legitimacy of history, knowledge and reality remind us of the need to teach critical thinking. Critical thinking helps us see through manipulative and politically distortive usages of language to suit ideological purposes. It keeps us open to surprises and makes us question our assumptions (Brookfield, 2012). For example, after the fall of the Berlin wall and the end of the Soviet Union more than 30 years ago, it was a common assumption that war in Europe would no longer be possible. This paradigmatic assumption has been proved to be false. In using the war in Ukraine as an opportunity to teach critical thinking, we can follow a generic model of gradual sequencing that prominently features modelling and scaffolding (Brookfield, 2012). In an era of weaponised lies and alternative facts (Levitkin, 2017), it is of paramount importance for us and our students to think critically, question information and seek to think beneath the surface. Critical thinking has a central role in education, from kindergarten to university, with the purpose of education being the creation of an informed citizenry. Although critical thinking – and teaching critical thinking – are challenging, it is when both teachers and students realise their own responsibilities for creating a learning community that learning is at its most useful and critical thinking is at its most empowering.

Scopus indexing and articles in this issue

While the problematic situation of the world that we touched on in the preceding section may leave many readers with emotions of anger and sadness, we are happy to report some exciting news at least in the context of our humble journal. As of last month, we have been informed that JALT is in the process of being indexed in Scopus. Scopus is not only the world's largest article and citation database, but also often regarded as the most prestigious index for education journals like ours. While we expect to receive a multiple of submissions as compared to pre-Scopus-indexing, we still intend to continue with our developmental and friendly approach to authors and their submissions. This milestone for JALT is the result of a team effort. The achievement would not have been possible without our fantastic Editorial Board members, Associate Editors, peer reviewers, authors

and readers. Special mention must also be made to Kaplan Singapore, our publisher, and its enlightened leaders.

The articles in this issue exhibit the usual great diversity of topics, article types, and countries of origin. There are nine research and review articles, two interviews with educational thought leaders, one EdTech review, two opinion pieces, three brief articles and six book reviews. Authors are from a wide variety of countries and all continents.

The first article of our current issue is by Caleb Or and Elaine Chapman on "Development and acceptance of online assessment in higher education: Recommendations for further research". The authors review the development of online assessment, in particular studies on student and teacher perceptions of online assessment published over a 15-year period. With online assessments being commonly used in higher education, it is crucial to assess the perceptions of the stakeholders in using this mode. Or and Chapman found that while students' perceptions are generally positive, academic staff members' perceptions have been more mixed.

The next study by Cherng-Yih Yen and an international team of co-authors examines how online social presence will predict various aspects of students' social interconnectivities in the social network of discussion boards within an online course. The factors studied in Yen et al.'s quantitative research were: in-degree, out-degree, betweenness centrality, closeness centrality, eigenvector centrality, reciprocated vertex pair ratio, and PageRank. The study's results show that only the predictive utility of social presence for all social network interconnectivity was supported. The roles of influencer, liaison, transmitter, social strategist and prestigious figure can be distinguished in a community of learners. The authors' findings support the need for online instructors to facilitate, guide, and support their students to navigate through the convoluted social interconnectivity effectively and continuously.

The third article by Kim Beasy et al. reflects on a unique student support programme within a School of Education in Australia and the perceptions of the academic staff who designed and delivered the programme. A combination of written and spoken critically reflective encounters were used to explore dimensions of student support. It was perceived that this programme has positively influenced some students in developing feelings of connectedness, building self-management skills and understanding commitment, and in establishing a foundation for a student experience that fosters a pathway towards a teaching career. Findings suggest that addressing students' needs necessitates a shared understanding of what constitutes student success and how this is interpreted within a support programme.

In another contribution from Australia, entitled "Re-orientating experiences: Considerations for student development through virtual mobility in STEM", Brittany Hardiman et al. explore how outbound mobility experiences (OMEs) provide a catalyst for learning environments that foster student development in a global context. The recent global pandemic has provided the higher education sector with an opportunity for wider implementation of online experiential learning environments such as virtual mobility. At present, there is not much exploration of the potential of transforming physical, short-term, face-to-face mobility programmes within an online environment for undergraduate science, technology, engineering and mathematics (STEM) students. Thus, this paper seeks to understand how we can meet the desired programme outcomes of a physical OME to support critical thinking of undergraduate natural science students, when the OME occurs online.

Chen Hungche and Yang Mingnuan investigate how the use of online student response systems (OSRS) in conjunction with an active question-and-answer technique affected student engagement and achievement in face-to-face classes. Results show that question-and-answer activities using OSRS (Socrative and Zuvio) platforms improve student engagement in large classes due to features such as anonymity and personalised feedback. Further studies need to be conducted with longer intervention plans in relation to vocabulary and reading comprehension tests.

Next, Kevin Adkins and co-authors evaluate a unique group of undergraduate researchers in their contribution on "A qualitative single-case study exploring the impact of a mentor and cohort on students' academic and career decisions". The researchers explore the influence of mentors on students' academic and career decisions. Results show that individuals who matriculated themselves as concurrently-enrolled students had fewer barriers than other students, for instance in terms of working with strangers and in labs. These findings present opportunities to fully explore the influence that a strong long-term mentor and extended participation in research have on students' postgraduate decision-making.

In "Determinants of university students' performance: Evidence from undergraduate economics students from a Bangladeshi University", Sayeda Chandra Tabassum et al. explore the factors that impact the performance of Bangladeshi university students. The researchers utilise an econometric model to explain the variation in the academic performance of undergraduate economics students. Several variables such as 'effort and motivation,' daily study time, the number of courses retaken, best friend's past performance and higher household incomes were found to be significant in impacting students' performances. Further research is recommended to compare the country's different economics departments or different universities.

The next two articles are our first contributions from Turkey and Papua New Guinea. In "Teaching nation-building and nationalism: a critical perspective of Turkish academia", Begüm Burak argues that nation-building policies should be seen as an attempt rather than a project that can be necessarily realised successfully. Her study offers a rich literature review that discusses the dynamics, key actors and stages of the nation-building process and nationalism and critically analyses how Turkish academia has dealt with nationalism education. Burak sheds light on how a revision in the dominant ideological framework of the state has led to changes in the content of history textbooks and curricula.

Motivation is crucial for students' mathematics learning at school. Jerome Oko's research focuses on the validity and reliability of a motivation scale questionnaire using the Rasch model (Partial Credit Model) in Papua New Guinea. The findings of his study reveal that researchers can produce different results from the construct validation depending on the selection of the methods of analysis employed. Oko's study contributes to the vast literature on how to improve student motivation.

In this issue, we have two interviews with outstanding educational thought leaders: Professors Antonia Darder and Stephen D. Brookfield. We are very grateful to Antonia Darder for giving us an unexpectedly extensive interview, despite her mourning the recent deaths of family members and friends. She is an internationally recognized scholar, artist, poet, activist, and public intellectual. This interview offers Darder's highly inspirational narration of how a colonized, impoverished minority woman became, against all odds, a highly regarded professor and activist-scholar. She takes us on a ride with her experiences in life (childhood, youth, encounters with racism and sexism) and her being strongly influenced by Brazilian critical pedagogue Paulo Freire. Through the interview, a holistic image of Antonia Darder emerges in which her work is a vocation and her life, research, teaching, activism and art are all intrinsically entwined.

The second interview follows up on a previous one with Stephen Brookfield in our journal (Brookfield et al., 2019). It was conducted as part of an ongoing book project with the working title *Teaching well* that Jürgen Rudolph and Shannon Tan are involved in. This interview may be seen as a teaser for the book that is planned to be published next year. It constitutes an extended version of one out of 13 planned chapters and focuses on how power shows up in higher education classrooms. In this interview, various influences on Brookfield's conceptual understanding of power, especially Michel Foucault's concepts of sovereign, disciplinary and bio-power and their applicability to education are discussed. In this context, we explore similarities between prisons and schools, the metaphor of the panopticon and the continued relevance of bio-power during the COVID-19 pandemic. The democratic practice of discussion groups is questioned (despite Brookfield's personal preference of that modality) and the lecture is reinstated as one of several useful options. We then arrive at Brookfield's concept of powerful teaching & learning and how teachers can exercise their power in ethical, productive and responsible ways.

This issue's EdTech review is authored by Alfred Yong and Jürgen Rudolph. They review Quizizz, a gamified student response system, and highlight its main features. Quizizz is an online tool for formative assessment and can be utilised both online and offline as well as synchronously and asynchronously. In the authors' view, Quizizz compares favourably with Kahoot. In any event, it is yet another useful tool that helps engage students.

JALT's current issue also contains two opinion pieces. The first is by Sam Choon-Yin that is entitled "Post-COVID-19 and higher education". The COVID-19 pandemic has compelled higher education institutions (HEIs) to review their standard operating procedures and purpose of existence. Sam's paper examines two thoughts as HEIs transition to a 'new normal' – the first relates to the future of online education in higher education and the second pertains to the relevance of degrees. It argues that stepping up the effort to ensure that university degrees remain relevant will be one of the most significant challenges HEIs have to work on.

The second opinion piece is by Jürgen Rudolph and Shannon Tan, entitled "The war in Ukraine as an opportunity to teach critical thinking". They explore the war in the context of various historical key events, reject a possible application of Baudrillard's perspective that 'there was no Gulf war' to the current conflict and compare Russian media fabrications with the Nazis' big lie technique. Rudolph and Tan argue that the war in Ukraine provides a reminder of the importance of critical thinking, discuss this complex concept and provide some advice how to teach critical thinking.

The next section contains three brief articles. In her entertaining article, Kayla Waters reviews the relevance of having meetings. With higher logistic and interpersonal demands of applied teaching, educators often have less time for meetings. While meetings are important, they are also frequently inefficient, ineffective, and demoralising. Hence, Waters reviews relevant studies on effective meeting redesign and recommends specific strategies for academics.

A second brief article sees Monideepa Becerra and Salome Mshigeni evaluate the role of a flipped class in an undergraduate epidemiology course. A quasi-experiment is utilised in evaluating students' attitudes, perceptions and self-efficacy of their epidemiology studies. Results reveal that these things changed significantly after the end of the course, reinforcing the benefits of integrating active learning with a more traditional lecture style.

The third brief article is entitled "Introducing the discovery case study: Brompton folding bikes". In it, Justin O'Brien and William Lanham-New seek to offer a learning design solution to the problem of student disengagement with case studies, and in particular, address the reluctance observed in some student groups to prepare for performative social learning encounters. A range of potential viable solutions are discussed before proposing the idea of a discovery case study (using the fascinating example of the Brompton folding bikes). The case study is further supported with reflective teaching notes on how to optimally use this innovative and immediately-plausible approach.

Finally, this issue contains six book reviews. Omona Kizito reviews *Understanding the higher education market in Africa* that was edited by E. Mogaji and coeditors. Africa is a huge and diverse continent, but the reviewed book goes some way in adding to our understanding of higher education there, discussing the history of colonisation in Africa, how formal education came about and the marketisation of higher education.

A second book review is contributed by Begüm Burak. She reviews Sam Choon-Yin's *Teaching higher education to lead: Strategies for the digital age*. The book is addressed to everybody with an interest in higher education and it

links technological development to demand for education, credentials of higher education and jobs while touching on issues of strategies and higher education policies for the digital age. Burak recommends Sam's book for a unique strategic perspective on our lifelong educational journey. Sam's aforementioned opinion piece in this issue builds on this book.

The third book review is authored by nelson ang who contributes a thoughtful piece on a graphic novel that is based on the great George Orwell's posthumously-published autobiographical piece: "Such, such were the joys". Whilst Orwell is world-famous for his political fable *Animal farm* and his dystopian novel *Nineteen eighty-four*, he wrote many other awe-inspiring works in his relatively short life. Ang compares the text of this publication with Orwell's original and raves about its highly successful transformation into a graphic novel.

A fourth review is provided by Mohamed Fadhil. It is about M. R. Fernando and J. M. Francisco's edited volume: *University and school collaborations during a pandemic. Sustaining educational opportunity and reinventing education*. It is laudable that the book is available as a free e-copy (whilst one can also purchase a hard copy). Mohamed Fadhil argues that the book's significance lies in its discussion as to how universities from around the world are organic and flexible in their approaches and responses to mitigate and manage the impact of the pandemic.

The issue is concluded by two book reviews by Jürgen Rudolph. The first one is about Arthur Shelley's latest book: *Becoming adaptable. Creative facilitation to develop yourself and transform cultures*. Shelley answers how we can remain adaptable over time, both in our professional and personal lives in expanding our comfort zone, building resilience, accelerating our performance and reducing our anxiety.

Rudolph's second book review is about Stephen Brookfield's and Mary Hess's *Becoming a white antiracist*. The authors posit that race, especially anti-Blackness is the biggest unaddressed problem in the U.S. and this is very much a problem of white people. Brookfield and Hess argue against the myth of the 'good white people' and reconstruct how white supremacy benefits Whites and has inserted itself into their consciousness. Whilst strong on theory, the book aims to primarily serve as a practical guide for educators, leaders and activists. The authors have succeeded in this endeavor and the book comes highly recommended.

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Development and acceptance of online assessment in higher education: Recommendations for further research

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Keywords

Assessment;
online assessment;
technology acceptance;
Unified Theory of Acceptance and Use of Technology (UTAUT).

Abstract

Online assessment is now used commonly in higher education institutions. While this approach to assessment has several advantages over paper-based assessments, its introduction often precipitates concerns from users, in particular, students and academic staff members. This paper traces the development of online assessment and reviews studies published on student and teacher perceptions of online assessment over a 15-year period. Studies suggest that while students' perceptions are generally found to be positive, academic staff members' perceptions have been more mixed. Recommendations for future research into teachers' responses to online assessment tools are made.

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Introduction

Educational technologies have evolved over the years to become an integral part of teaching and learning processes in the higher education sector. The early 1960s marked the first attempt to use computers to assist education assessment processes (Woolley, 1994), with web-based online testing software then introduced in the 1990s (Bull & Stephens, 1999). In more recent times, with reduced teaching resources and increased student numbers, teachers across all levels of education have needed to do more with less by adopting technology (Donnelly, 2014; Nicol, 2007). This trend has given rise to the rapid growth of online learning and assessment approaches within the higher education sector. As a consequence, over the last two decades, online assessment has come to replace paper-based assessments in many colleges and universities (Boitshwarelo et al., 2017).

The novel coronavirus (COVID-19) pandemic saw education systems around the world confront tremendous challenges due to the shutting down of schools and university campuses. In this context, such institutions were forced to find ways to continue teaching and learning activities without the physical attendance of staff members or students (UNESCO, 2020). Inevitably, many schools and universities turned to online learning platforms to address this need. The same challenges were seen in terms of implementing student assessments, and UNESCO (2020) listed a shift to online assessment as one of the five main strategies that countries had adopted to manage high-stakes assessments during the COVID-19 crisis.

In the next few sections, we discuss the development of online assessment different forms of online assessment, as well as the potential of online assessment to enhance processes and outcomes in education institutions. This includes a consideration of how students and teachers have been reported to respond to online assessment, based on the existing literature. We then propose the need for an integrated theoretical model to direct future research on users' acceptance of online assessment approaches. The paper focuses exclusively on the use of online assessment within higher education, given that the challenges confronted by end-users within schools are likely to differ from those of users based in colleges and universities.

Online assessment

In recent years, the delivery of educational assessments in many institutions has been shifted from traditional pen-and-paper methods to various forms of online assessment with the use of computer technology (Cavus, 2015; Diprose, 2013; Dube et al., 2009; Stone & Zheng, 2014). The term *online assessment* is often used interchangeably with the terms *electronic assessment* or *e-assessment* (Jordan, 2013), computer-assisted assessment (Bull & McKenna, 2003; Sim et al., 2004), computer-mediated assessment (Huot, 1996) and computer-based assessment (Fluck et al., 2009). The primary characteristic of all of these approaches is the use of some computerised technology to deliver assessment tasks (Bull, 1999; Chalmers & McAusland, 2002). Typically, online assessment is used as the delivery mode for multiple-choice questions, online or electronic submission and computerised adaptive testing (Collares & Cecilio-Fernandes, 2019; Wang & Kingston, 2019). Assessments at any stage of the learning process (i.e., for formative, diagnostic or summative purposes) can be delivered in an online format.

Within university settings, online assessment allows faculties to have large number of candidates selecting answers to questions on a computer that is connected to an internet site that contains a database. Instant and detailed feedback may or may not be enabled, depending on the intent of the assessment (i.e., whether it is a formative or summative task). The increased efficiency of online assessment means that educational institutions can do more with less (Alruwais et al., 2018). As Gipps (2005) noted, enhanced efficiency and the potential to enhance pedagogical processes are the main reasons for using online assessment. With automated marking and feedback, online assessment is viewed as efficient, fast and reliable, making it useful, particularly in cases where large numbers of students are being tested.

Computer-assisted assessment and online assessment

Computer-assisted assessment, by definition, is the use of computers for assessing student learning (Bull & McKenna, 2003). Various authors have differentiated amongst types of computer-assisted assessment, with one example shown in Figure 1. In broad terms, computer-assisted assessment is defined as the use of computers for assessing student learning and covers the whole process of assessment involving test marking, analysis and reporting (Chalmers & McAusland, 2002; Conole, & Warburton, 2005; Bull & McKenna, 2004). For example, Optical Mark Reading (OMR) and portfolio collection are considered to be forms of computer-assisted assessment. OMR, also known as "mark sensing", remains one of the widely used computer-assisted assessment methods at present. OMR uses a computer to mark scripts composed initially on paper. It is a technique to sense the presence or absence of marks by recognizing the depth of darkness on an answer sheet, usually filled with a pencil or ballpoint pen (Deng et al., 2008). Electronic portfolio collections, another form of computer-assisted assessment, is the use of a computer to collect scripts or written work (McLoughlin, 2003).

Computer-based assessment, on the other hand, involves using a computer programme to mark answers that are entered directly into a computer (Fluck et al., 2009). This form is characterized by the interaction between the student and computer during the assessment process (Charman & Elmes, 1998). In computer-based assessment, test delivery and feedback provision are performed through the use of a computer. This form can be subdivided into standalone applications that only require a single computer, applications that work on private computer networks, and those that are designed to be delivered across public networks such as web-based online assessment (Conole & Warburton, 2005).

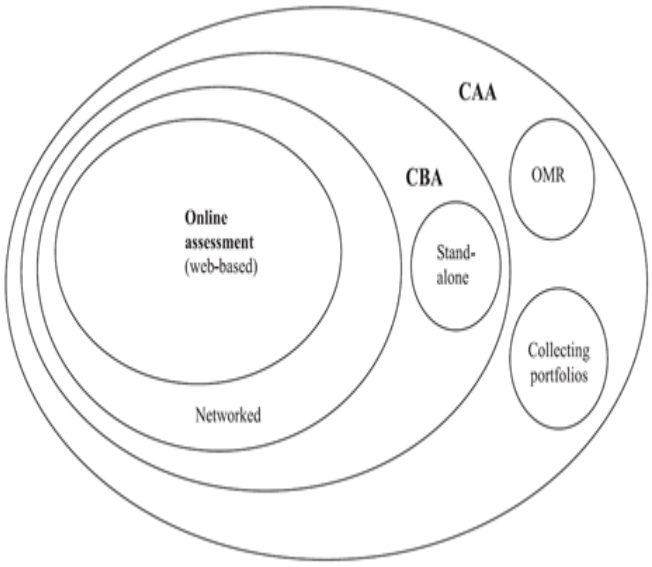

Figure 1. Different types of computer-assisted assessment. Note: Adapted from Conole & Warburton (2005).

From computer-based assessment to online assessment

In order to take a closer look at online assessment, it is essential to differentiate various related terms that have been used in association with this term in recently published works. To this end, a 'desktop research' study was initially carried out to gather data on the terms used in the last two decades (from 2001 to 2020). The benefit of using a desktop research approach is that it allows for a longitudinal analysis to understand how the term "online assessment" has been used over the last two decades. It provided a basis for comparison as the technologies used in assessment have evolved over time. The desktop research helped the authors understand that although terms like "computer-based assessment" and "online assessment" are used interchangeably, there was a trend towards using the latter. In this study, a search was first conducted using the Education Resources Information Center (ERIC) database for abstracts containing terms related to online assessment. Each search consisted of one and only one specific phrase. For example, the phrase containing only "online assessment" was searched, and the number of times this term had appeared in abstracts between 2001 and 2020 was recorded.

From the search, "Online Assessment" appeared most frequently in all publications listed, followed by "Computer-assisted Testing". Other frequently appearing terms included "Online Testing", "Computer-assisted Assessment" and "Online Examination". In Figure 2 and Figure 3, the search results from the ERIC database in 2020 are shown. "Online Assessment" remains the most frequently used term, followed by "Online Testing", "Computer-assisted Testing", "Electronic Assessment" and "Computer-assisted Assessment". Therefore, for discussion in this paper, the phrase "online assessment" will be used consistently to refer to assessments conducted either online or with the aid of a computer device.

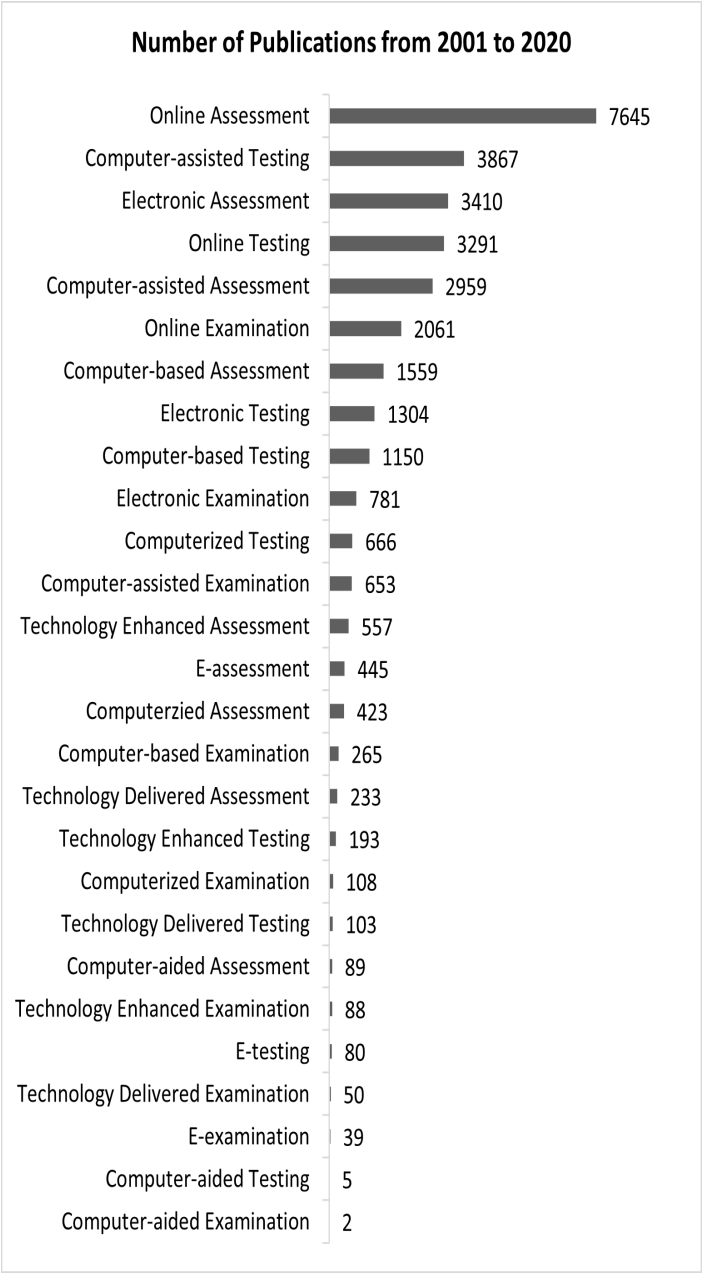

Figure 2. ERIC Database search on assessment-related abstracts from 2001 to 2020. Note: Number of Publications from 2001 to 2020; data extracted on 8 September 2020 From ERIC Database; https://www.eric.ed.gov/

Development phases in online assessment

Historically, three main phases can be seen in the development of online assessment (Figure 4). The first phase from the 1960s to 1990s involved the use of computers in assisting assessment. The second phase from the 1990s to 2000s saw the emergence of adaptive testing and the rise of the learning management systems. In the third phase that commenced in the 2000s, the use of Web 2.0 tools, artificial intelligence and analytics was introduced.

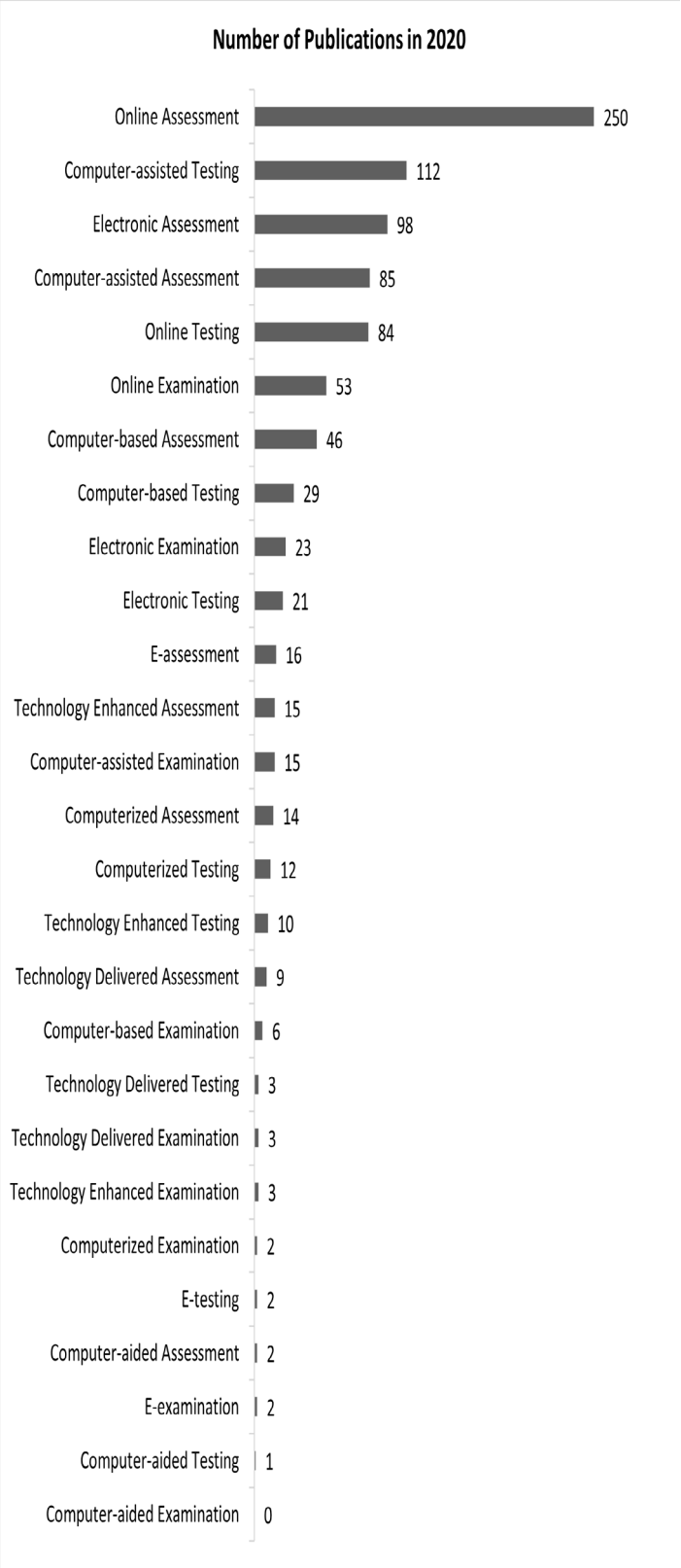

Figure 3. ERIC Database search on assessment-related abstracts in 2020. Note: Number of Publications in 2020; data extracted on 8 September 2020. From ERIC Database; https://www.eric.ed.gov/

Phase 1: Computer-assisted and computer-based assessment (1960 – 1990)

In the period from 1960 to 1990 (Phase 1), computers were the conventional electronic means of delivering online assessment, and assessments or testing were primarily

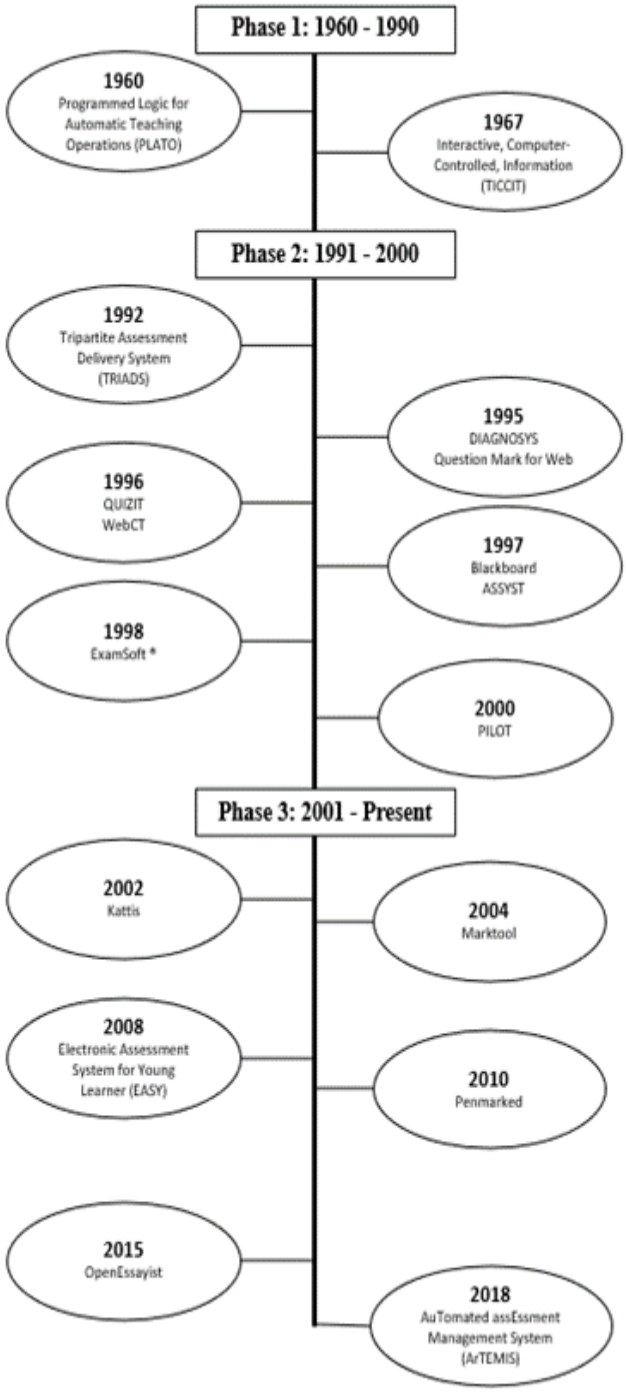

Figure 4. Computer-based examination systems, online assessment systems and assessment tools (1960 to present).

computer-assisted or computer-based. Examples of computer-assisted and computer-based tools used during this phase included databases, spreadsheets and expert systems. The first apparent attempt to use computers to assist the assessment process in the early 1960s was the Programmed Logic for Automatic Teaching Operations (PLATO) project, initiated by the University of Illinois (Smith & Sherwood, 1976, Woolley, 1994). The users of PLATO ranged from grade school students learning reading and mathematics, to graduate students learning complex concepts in the medical sciences.

The other example of a large-scale assessment project that used computers during this period was the Time-Shared, Interactive, Computer-Controlled, Information Television (TICCIT) in 1967 (Anderson, 1976). Other earlier attempts included the use of computers to automatically assess student programming assignments (Douce et al., 2005; Forsythe & Wirth, 1965; Hollingsworth, 1960). The assessment process was then affected by the revolution of microcomputers in the 1980s (Reiser, 2001). In the 1980s, there was an increased interest in using computers in instruction, and computers were used in automating instructional design tasks (Rottmann & Hudson, 1983). During the same period, large-scale multiple-choice tests were administered through the means of machine-readable forms, known as Optical Mark Recognition (OMR) forms, which are still in use today. In assessments facilitated by the use of OMR forms, students who are taking examinations shade their answers to selected-response questions on sheets that have been specifically designed for such a purpose (Jordan, 2013).

Phase 2: Adaptive testing and web-based assessment (1990 – 2000)

Phase 2 took place from 1990 to 2000, when computer capabilities increased to provide a broader range of options such as data processing and simulations. During the same period, many other sophisticated systems had emerged like the Tripartite Assessment Delivery System (TRIADS) from the University of Derby in 1992, which included varied question types to test higher-order skills (Allen, 1998; Boyle & Hutchison, 2009; Burrow et al., 2005; Cox et al., 2008). TRIADS is still in development today.

Another sophisticated system that emerged then was DIAGNOSYS, an adaptive testing software designed to prepare undergraduates for the study of physics and engineering (Appleby et al., 1997). Such adaptive testing systems measure users' abilities by 'building', dynamically, an individualised test for each user (Chang & Ying, 1996). DIAGNOSYS, first developed in 1995, is based on a hierarchy of skills, in which each question delivered to a user depends upon on the previous answer given. The test items are selected sequentially, according to the current user's performance. As a consequence, the test is tailored to each user's ability by adjusting the difficulties of the items delivered to the responses given by the user. This means that higher-achieving users can avoid responding to a large number of easy items, and lower-achieving users are not confronted with a large number of items that are too difficult. During the same period that DIAGNOSYS was developed, there was the increased use of the World Wide Web, which led to the first commercial launch of web-based testing software, Question Mark for Web (Bull & Stephens, 1999).

Towards the end of Phase 2, a decline in computer-assisted or computer-based approaches could be seen, with an increasing emphasis on web-based assessments. The exponential growth of internet usage seen at this time was a key factor in the decline observed. For instance, Blackboard, a widely used web platform released in 1997, had the capability to provide automatic grading of multiple choice and True/False questions. Systems such as QUIZIT (Tinoco et al., 1997), WebCT (Goldberg & Salari,1996), ASSYST (Jackson & Usher, 1997), ExamSoft® (Wadley et al., 2014) and PILOT (Bridgeman et al., 2000) were also examples of web-based systems with the ability to deliver and facilitate online testing and grading. These applications reduced emphasis on the more traditional forms of computer-assisted or computer-based approaches that had been developed previously.

Phase 3: Web 2.0 tools, artificial intelligence and analytics (2000 – present)

Phase 3 began in 2001 and incorporates developments to the present day. During this period, e-learning took the forms of virtual classrooms, computer-mediated communications and online cooperative learning. Examples of online assessment tools that appeared over these years included the use of e-portfolios, blogging, social networking and web authoring systems (Conole & Alevizou, 2010). In 2005, WebCT was acquired by Blackboard, and the web-based system was retired in 2013 (Seepersaud, 2011). Over the last two decades, other prominent learning management systems with proprietary assessment capabilities were also released. For example, the Moodle learning management system, an open-source virtual environment, had a significant influence on the development of online assessment tools (Jordan, 2013).

Besides the growth in the number of learning management systems with online assessment features, many online assessment tools have also emerged in the market in recent years. These online assessment tools focused more on supporting teachers' assessments and grading than on automated evaluation. For instance, MarkTool (Heinrich & Lawn, 2004) introduced an onscreen marking tool that allows markers to annotate PDF documents sent by students with formative feedback. The annotations are either textual and graphical and can be recorded and linked to each student. Penmarked (Plimmer, 2010), another software solution, supports the marking and annotating of students' assignments with free-form ink annotations and associated marking tasks, like gathering and returning assignments, and recording grades.

The last decade also ushered in systems that utilized more advanced techniques to enrich the assessment process, such as semantics, artificial intelligence, natural language processing, or personalised questionnaires. For instance, Hirata and Brueckner (2008) used AI devices such as neural networks, decision trees, and inference engines to support the creation of questions and to keep track of students' learning. They proposed a framework for an Electronic Assessment System for Young learners (EASY). The approach generates results at the end of an assessment and permits revision, as well as a follow-up stage, by using the records of the answers. The specific methods used are: (1) clustering techniques, which enable the system to group the characteristics of the learning objects; (2) forward chaining, which is used to identify objects that users are thinking of when using the system; and (3) backward chaining, which checks the answers and allows for revisions based on these answers.

In another example of an advanced assessment system, Jordan and Mitchell (2009) proposed a natural language-based system, Intelligent Assessment Technologies (IAT), deployed by the UK Open University, to create and mark short-answer, free-text assessment tasks. Evaluations of the answer matching process provided by this system has been demonstrated to have similar or higher accuracy to that of expert human markers. Students attempt the questions online and are given detailed feedback on incorrect and incomplete responses, and can repeat the task immediately to learn from the feedback provided. Also in the area of natured language-based systems, the Supportive Automated Feedback for Short Essay Answers (SAEeSEA) project uses a Natural Language Analytics engine to provide feedback on students' essays for summative assessment (Ras at al., 2015). OpenEssayist, which was part of the SAEeSEA, is a real-time learning analytics tool which provides automated feedback on a draft essay, operating through a linguistic analysis engine that is imbedded within a web-based application.

In the context of assessing computer programming abilities, automated assessments for computer science courses were also developed such as the Kattis in 2002 (Basnet et al., 2018; Enström et al., 2011). Krusche and Seitz (2018) also introduced AuTomated assEssment Management System (ArTEMiS) that automatically assesses solutions to programming exercises and provides instant feedback so that students can iteratively solve the problems presented. ArTEMiS provides an online code editor with interactive exercise instructions. The system is programming language agnostic and applies to a variety of computer science courses. Using ArTEMiS, students gain experiences in version control, dependency management and continuous integration while attempting to solve programming tasks. ArTEMiS is suitable for beginners in programming, and helps students to realise their progress and gradually improve their programming solutions. In doing so, it can also reduce workloads for computer science instructors with large classes, and enhance students' learning experiences.

As we trace the development phases of online assessment, from the first use of computers to assist assessment to the current auto-marking web-based assessment, it is clear that technology has had a significant impact on assessment. As more and more educational institutions adopt online assessment, it raises questions on how teachers and students accept and use new assessment approaches. However, numerous questions have not yet been addressed on the subject of how these new approaches are being adopted in practice by educational institutions. According to Stödberg (2012), who examined a total of 76 articles published in three journals from 2006 to 2012, empirical studies on e-assessment had mainly focused on formative assessments by that time. Research approaches in this field have been highly disparate, and have typically focused on specific applications within particular contexts. As a result, it is often not possible to compare results across studies. Thus, in addition to an obvious need for further research on how teachers and students accept new technologies in assessment, there is also a need for a more systematic approach to the study of online assessment adoption in research.

Forms and potential advantages of online assessment

The term online assessment is often used interchangeably with the terms, electronic assessment or e-assessment (Jordan, 2013), computer-assisted assessment (Bull & McKenna, 2003; Sim et al., 2004), computer-mediated assessment (Huot, 1996) and computer-based assessment (Fluck et al., 2009). While there are subtle differences in the way that these terms are used across publications, all refer to the use of some computerised technology to deliver assessment tasks (Bull, 1999). Various types of computer-assisted assessment have been described in the research literature, including:

- Optical mark reading (OMR), also known as "mark sensing", in which a computer is used to mark scripts composed initially on paper. This is a technique which senses the presence or absence of marks by recognising their depth of darkness on an answer sheet, filled with a pencil or ballpoint pen (Deng et al., 2008).

- Online or e-portfolios, in which a computer is used to collect scripts or written work (McLoughlin, 2003).

- Computer-based assessment, which involves a computer program marking answers, entered directly into digital form (Fluck et al., 2009). This approach can be subdivided into stand-alone applications that only require a single computer with applications that work on private networks, and those designed to be delivered across public networks such as web-based online assessment (Conole & Warburton, 2005).

Online assessment approaches have been reported to offer several advantages over paper-based assessment. These include:

(i) Providing immediate and anonymous feedback to students on assignments and assessments (Barkley, 2002; Llamas-Nistal et al., 2013; Spivey & McMillan, 2014; Ridgway et al., 2004). Immediate feedback rewards well-prepared students and encourages students who did not perform well to enhance their performance. Teachers also have more control over when feedback is given using this approach. For example, teachers can set feedback to be delivered after a specific time interval once questions are completed. Varying degrees of feedback such as test scores, test scores with correct answers, or test scores with detailed solutions may be provided.

(ii) Making assessment more efficient, particularly in cases where a large number of candidates is assessed (Gipps, 2005). With online assessment, teachers can test students on a wide range of topics in one short test easily (Boitshwarelo et al., 2017; Brady, 2005). The ability to create, manage, and deploy online assessment means that a large part of the manual grading work can be automated. This not only reduces the instructional and administrative costs of teaching courses with large enrolments, but also indirectly affects the amount of learning that takes place in the course by lowering the costs of administering more frequent assessments.

(iii) Reducing costs. Placing course material online can result in significant cost savings because paper, copying, and distribution expenses are all reduced or sometimes eliminated. Copying and delivery of assignments to classes with massive enrolments are often costly and inefficient (Barkley, 2002). Faculties wanting to reduce expenditures are likely to support the transition from paper assignments and assessments to online assessment.

(iv) Increasing assessment reliability. Online assessment has been found to improve examination and testing reliability with machine marking, improved impartiality, and enhanced question styles that incorporate interactivity and multimedia (James et al., 2002; Mora et al., 2012).

(v) Moving examinations out of regular class time, allowing teachers to cover more content or the same content in more depth (Barkley, 2002; Barua, 1999). Online assessment also allows the offering of flexible testing times, delivery periods and frequent testing (Spivey & McMillan, 2014).

(vi) Facilitating distance-learning courses. As online assessment only requires a computer device and internet connection, there is no need for students to be on campus. As such, online assessment has the potential to transform teaching and learning by removing the constraints of time, distance and space (Cirit, 2015; Lei & Gupta, 2010).

Students' acceptance of online assessment

Various studies have affirmed that testing format typically has little or no effect on actual academic performance (Anakwe, 2008; Bloom et al., 2018; Escudier et al., 2011; Spivey & McMillan, 2014; Wadley et al., 2014; Zandvliet & Farragher, 1997). Based on the results of this kind, students do not appear typically to be disadvantaged through the use of online assessment approaches. Despite these findings and the potential advantages of the approach, the success and adoption of online assessment in education settings will inevitably hinge upon its acceptance by end-users - namely, the educators and students. As a result, we must look at how educators and students perceive and respond to this approach, as well as its impact on the teaching and learning process.

The majority of student acceptance studies that have appeared with respect to online assessment have focused on its use in medical and/or health education (Bloom et al., 2018; Boevé et al., 2015; Deutsch et al., 2012; Jawaid et al., 2014; Lewis & Sewell, 2007; Usir & Ahamad, 2017; Wadley et al., 2014), with a smaller number examining its use in subject areas such as engineering (Riera Guasp et al., 2018), foreign language studies (Fageeh, 2015) and social science education (Hewson & Charlton, 2019). This section presents a brief review of studies that have appeared internationally across these discipline areas.

Deutsch et al. (2012) conducted a study at Leipzig Medical School, in which all enrolled fourth-year medical students in one year took a web-based 'mock' examination. The majority of participants indicated that they felt confident in dealing with computers, with female students being significantly less convinced of their abilities in this regard. Students' views of online assessment were also found to improve after completing the assessment, with respect to their overall attitudes towards online assessment; its perceived ease of use; the perceived objectivity of the assessment; and their acceptance of computer or web-based methods in the teaching and learning process. Differences in attitudes across male and female students seemed to be attributable to differences in their perceptions of computer self-efficacy. Initially, females' reservations about technical problems affecting the accomplishment of online assessment were significantly higher than those of males. However, female students' overall attitudes towards online assessment were found to shift positively after undergoing the assessment. Although different before the test, male and female students' attitudes were found to be similar after the exposure to the web-based examination.

Kumar et al. (2013) surveyed 126 first-year medical students on the use of an online portal for assessment in India. Results indicated that students felt comfortable in using the online assessment approach and that they had favourable attitudes toward the immediate feedback this approach afforded. Other comments from students indicated that they saw additional advantages to the approach, which included the reduced potential for errors, the potential to enhance the testing of knowledge depth, and the flexibility afforded by the approach (e.g., the ease with which respondents can deselect answers on re-considering their choices).

Jawaid et al. (2014) conducted a study with 173 Dow University of Health Sciences postgraduate residents on their perceptions of online assessment and their preferences for paper-based or online assessment. Results indicated that while 23.6% of the residents were not entirely confident in using the approach before sitting the online assessment, 64.8% were either confident or extremely confident in undertaking online assessments after their initial experiences with it. A common problem (28.9%) encountered by students was logging in, which would typically be an issue that is easily addressed. In all, 61.8% rated online assessment as better overall than paper-based assessment after experiencing it for the first time.

Several studies have been conducted to examine students' responses to online assessment in other health science disciplines (Bloom et al., 2018; Bernardo et al., 2004; Rajab et al., 2020). For example, in 2013, the Campbell University College of Pharmacy and Health Sciences adopted the use of ExamSoft® assessment program in all required courses in the Doctor of Pharmacy program (Bloom et al., 2018). In a survey of 269 students who completed the assessments, findings showed no significant differences in perceived comfort with the approach based on gender, age, or prior experience with online courses or assessment. Although the student population as a whole felt comfortable using ExamSoft®, there was evidence that specific sub-populations held different perceptions. Younger male students were found to be more likely to be comfortable with ExamSoft®, which was attributed to a higher level of prior familiarity with computers. Students using computers for daily routine tasks, like taking notes in the class were also more likely to report that the feedback provided after the online exam was useful for understanding their performance. The same group of students was also less likely than those who reported difficulties in using ExamSoft® to perceive a negative impact on their examination performance.

Cirit (2015) conducted a study with pre-service teachers to access their perceptions towards paper-based, online and alternative assessments and to examine whether their attitudes changed toward the types of assessment after Web 2.0 tools were implemented. The analysis of the survey data with 155 participants showed a positive attitude towards the use of online assessment methods. In particular, participants felt that online assessment appealed to different types of learners, and was helpful because teachers did not have to be in the same physical location as the students. The participants reported a highly positive attitude towards online assessment for English language and teaching skills. They felt that online assessment could provide authentic tools that other assessment methods could not in English methodology courses. Most importantly, these participants agreed they would like to use online assessment methods in their English courses when they graduated and become teachers.

A few studies on attitudes toward online assessment have also appeared focusing on students in engineering, computer science, foreign language and social science education. In one study focusing on first-year engineering students, Riera Guasp et al. (2018) studied perceptions of online examinations in the context of blended assessment with 463 students from Universitat Politècnica de València, Spain. In this study, Auto-scored Computer-Based Assessment (ACBA) was used as part of the blended assessment in the subject of physics for first-year Engineering degrees. Results showed that there was an overall positive perception of the ACBA tool, especially with respect to its ease of use, and its utility during the learning process, because the ACBA tests helped students prepare for their examinations. Despite this, students were critical of the rigidity of the automatic scoring process used.

In the area of foreign language studies, Fageeh (2015) reported that students were willing to convert to web-based assessment activities in a study of students' and faculty members' attitudes towards online testing using the Blackboard learning management system. The survey was conducted with 400 students and 25 faculty members, at the Faculty of Languages & Translation, King Kalid University. Findings indicated that the students were confident in taking the online assessments, and enjoyed using Blackboard for this purpose. They reported perceiving this approach as useful for undertaking their language assessments.

In contrast to the positive results reported above, in a study with 401 first-year psychology students at the University of Groningen in the Netherlands, Boevé et al. (2015) found that approximately 50% of the students they surveyed indicated a preference for paper-based multiple-choice examinations before taking their first computer-based examinations, with 25% indicating no preference for the medium of assessment, and only 25% indicating a preference for computer-based assessment. After completing their first computer-based assessment, 16% remained positive, 43% of students felt more positive, 12% remained negative, 14% felt more negative, and 15% remained indifferent towards computer-based examinations.

It is clear from this review that while the majority of studies conducted thus far have suggested an overall positive response from students toward online assessment, findings from others have been more mixed. Such mixed responses accumulated from system usage problems faced by students as well as the negative and indifferent attitudes towards online assessment system, and the automatic scoring process within (Boevé et al., 2015; Jawaid et al., 2014; Riera Guasp et al., 2018). While the level of detail provided in these papers did not allow for the identification of the critical factors that moderated students' responses, it is likely that the specific characteristics of the online assessment approaches or systems used in each study contributed to this variability.

Teachers' acceptance of online assessment

While various studies have appeared on students' perceptions of, and attitudes towards, online assessment, studies on teachers' responses to online assessment have been more scarce. Among these studies, Jamil et al. (2012) surveyed 314 teachers in Pakistan universities on their perceptions on computer-based and paper-based examinations. Results indicated that while the majority of the teachers disagreed with the statement that computer-based testing was the 'worst' tool for assessment, they did note the need for a 'master plan' to introduce computer-based examinations at the national level. Collectively, they also agreed that using computers minimised clerical mistakes and that computer-based examinations allowed them to assess more students in less time.

In an online study with a random sample of 25 teachers from the English department in King Khalid University, Fageeh (2015) confirmed that most teachers were willing to convert to web-based assessment activities using the Blackboard learning management system. Findings showed that teachers had positive attitudes to apply e-testing technology in delivering formative and summative assessment online, believing that this technology was an assistive learning

tool that was complementary to e-learning. However, when the effect of age on attitudes on online assessment was examined, there was a difference in attitudes towards online testing across different age groups of teachers. The findings did not indicate which age group was more positive. This finding, however, does suggest a potentially important moderator variable in educators' attitudes to the introduction of online assessment methods.

Hamsatu et al. (2016) conducted a study with 30 teachers in a Nigerian higher institution and found that although these teachers agreed that online assessment was helpful, the potential benefits were not reflected in students' assessment performances. Teachers commented in this study that the use of online assessment might provide too much opportunity for the students to check their answers, and thus, could encourage 'laziness' in the students. The teachers also expressed the view that the assessment process should not be over-dependent on technology. However, the majority affirmed that online assessment was time-saving and lessened the burden associated with examination processing.

Bloom et al. (2018) reported that faculty members had difficulties with computers when an ExamSoft® assessment program was implemented at the Campbell University College of Pharmacy and Health Sciences. Of the 35 faculty members who responded to the survey, 68% reported they had trouble at least once while creating an online examination, and 59% reported having had at least one problem during the administration of an examination. The faculty members did not perceive an impact on examination performance due to the adoption of ExamSoft®, and the analysis of examination grades indicated no significant performance differences across paper-based and ExamSoft® examinations. Despite the difficulties encountered, educators in this study saw the benefits of ExamSoft®, and indicated preferring it to paper-based examinations.

Amante et al. (2019) conducted a survey with 130 teachers and 424 students from Public Universities and Polytechnic Institutes of Portugal on the factors influencing digital assessment. Findings showed that approximately 70% of the teachers felt that there was a lack of knowledge on the use of technology in the teaching subject area (68%), as well as how online activities were assessed (67%). Other difficulties cited were the extra time commitments needed by teachers to implement the approach (38%), the additional effort needed to learn on the part of teachers (35%) and fears related to potential technical problems (35%). The researchers concluded that teachers' perceptions of digital assessment were not directly related to the teachers' age groups. Similar results were reported by Rolim and Isaias (2018), in which 168 higher education teachers in Portugal were surveyed on their views about using e-assessment approaches. The majority reported considering digital assessment as a beneficial alternative to paper-based assessments, but also cited "insufficient knowledge" as a potentially influential factor in whether online assessment would be accepted by colleagues and students.

Although the studies reviewed revealed that teachers had responded well to the transition to online assessment, implementation issues and challenges were also uncovered. For instance, additional workload and efforts to learn were required to use online assessment systems effectively (Amante et al., 2019; Rolim & Isaias, 2018). Like in the studies on students' acceptance, the trust of online assessment process also casted a shadow on teachers' confidence in the online assessment system and its automatic grading processes (Bloom et al., 2018; Hamsatu et al., 2016).

Need for an integrated model to direct research on users' acceptance of online assessment approaches

To ensure that the advantages of online assessment for higher education are fully realised, the approach must ultimately be accepted favourably by its end-users. Most studies on the acceptance of online assessment to date have focused on students, with research on teachers' acceptance of online assessment being comparatively limited (Chien et al., 2014; Imtiaz & Maarop, 2014). This is surprising, given that it is the teachers who design, administer and deliver the online assessments, and thus, will be the primary decision-makers in terms of whether the approach is adopted, the extent to which it is used, and the success with which it is integrated into ongoing teaching and learning processes (Amante et al., 2019).

Many disparate studies on the factors that can impact teachers' intentions to use technology-based pedagogical and assessment tools have appeared within the literature (Amante et al., 2019; Bloom et al., 2018; Fageeh, 2015; Hamsatu et al., 2016; Jamil et al., 2012). For example, various authors have suggested that administrators should implement online assessment systems that are user-centric in their designs, providing simple, clearly explained and consistent navigations that allow both teachers and students to navigate through assessment items with ease (Webb et al., 2013). This remains, however, an area in which much progress could still potentially be made. In the authors' views, progress within this field has been hampered by the absence of an integrating theoretical framework. Many papers published thus far, therefore, have focused on a range of factors that may be quite idiosyncratic to their specific contexts. We argue that a more general, systematic approach, drawing upon sound theoretical frameworks, is needed for the field to move along.

Among the many technology acceptance models that have appeared to date, the United Theory of Acceptance and Use of Technology (UTAUT) is a sound candidate for addressing such a need. In developing the UTAUT, Venkatesh et al. (2003) consolidated various previous Technology Acceptance Model (TAM) theories (Davis, 1989, Taylor & Todd, 1995) and related models of behaviour (Ajzen, 1991; Compeau et al., 1999; Fishbein & Ajzen, 1975; Moore & Benbasat, 1991; Thompson et al., 1991). In the UTAUT, four constructs play a significant role as direct determinants of user acceptance and use behaviour: (1) performance expectancy, or the degree to which an individual believes that using the system helps him or her to attain gains in his or her job performance; (2) effort expectancy, or the degree of ease with which the user can

deploy the system; (3) social influence, or the extent to which an individual perceives that important others believe he or she should use the system; and (4) facilitating conditions, or the degree to which an individual believes that there is an existing organisational and technical infrastructure to support the use of the system (See Figure 5). In the original UTAUT, attitude toward using technology, self-efficacy and anxiety are not direct determinants of behavioural intentions to use technology, though the exclusion of these elements has been contested by other researchers (Dulle & Minishi-Majanja, 2011; El-Gayar & Moran, 2006; El-Gayar et al., 2011; Khechine & Augier, 2019; Moran et al., 2010).

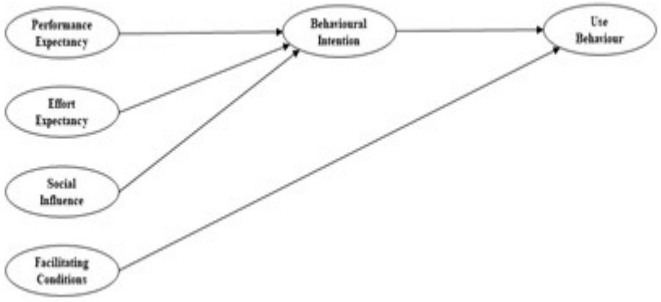

Figure 5. Unified Theory of Acceptance and Use of Technology. Note: Adapted from Venkatesh et al. (2003).

We propose that an extended model that draws upon the strong theoretical foundations of the original UTAUT model could provide a systematic basis for further research into teachers' intentions to use online assessment methods. This proposed extended model is depicted in Figure 6.

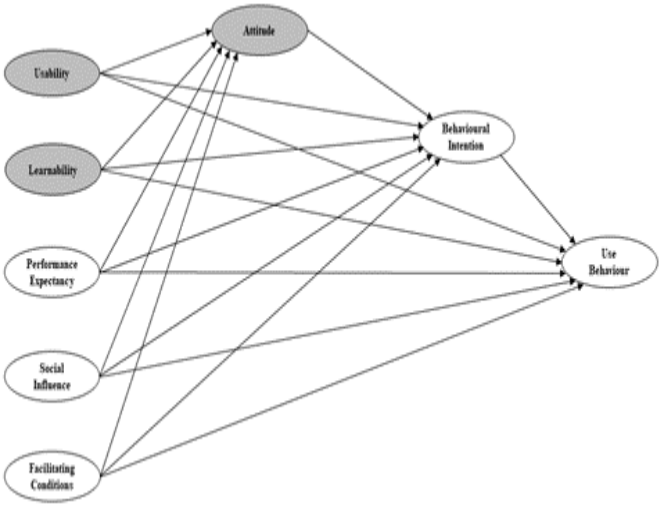

Figure 6. Extended UTAUT Model. Note: Adapted from Venkatesh et al. (2003).

In the proposed extended model, attitude has been introduced as a construct. The rationale for including attitude into the proposed extended model is that many previous UTAUT extension studies have found that attitude significantly influences users' behavioural intentions (Botero et al., 2018; El-Gayar & Moran, 2006; El-Gayar et al., 2011; Jairak et al., 2009; Khechine & Augier, 2019; Moran et al., 2010; Nassuora, 2012; Shuhaiber, 2015; Thomas et al., 2013). The proposed extended model also includes two new constructs: usability and learnability. Usability is the degree of ease with which users can adopt the system to achieve their objectives with effectiveness, efficiency and satisfaction (Bevan et al., 2015; Jokela et al., 2003; Shackel, 2009). Learnability refers to the extent to which users can quickly become familiar with the application and make use of all relevant features and capabilities, which will depend heavily on the quality of the system interfaces (Jeng, 2005; Nielsen, 1994). These additional constructs have been incorporated into the extended model based on findings that both usability and learnability have a significant impact on user's acceptance of technology in different contexts (Jeng, 2005; Joo et al., 2011; Zbick et al., 2015).

Conclusions and recommendations

To ensure that the advantages of online assessment for higher education are fully realised, the implementation must be accepted favourably by its end-users. Most studies on the acceptance of online assessment to date have focused on students, with research on teachers' acceptance of online assessment being comparatively limited (Chien et al., 2014; Imtiaz & Maarop, 2014). This can make it difficult for administrators who wish to introduce online assessment systems to determine how this can best be done.

In this paper, we have argued that an extended UTAUT can be used to better integrate research into enhancing the adoption of online assessment within universities by teaching staff members. In the extended UTUAT, users' responses to technology still depend on factors such as performance expectancy (PE), facilitating conditions (FC) and social influence (SI), as in the original UTAUT. However, users' attitudes, and the perceived usability and learnability of systems are also proposed to have a significant impact on users' intentions to adopt the system (BI). The extended UTAUT is proposed here as a model that may increase the power with which teaching staff's acceptance of online assessment systems can be predicted.

Moving beyond questions of design, the context in which online assessment approaches are introduced is also likely to be an essential factor in users' acceptance of the approaches. The success of any shift to online assessment will require 'buy-in' from both the students and the teachers. The level of buy-in seen from teachers is likely to be a product of myriad factors, including the nature of the technology, the organisational context, and the model used to manage the change process (Legris et al., 2003; Orlikowski & Hoffman, 1997). Hence, faculties need to consider carefully how they should enact the change process when introducing new online assessment systems. The following strategies may help to ensure that teachers respond more favourably to shifts from paper-based to online assessment systems.

(i) Ensure that proper scaffolding is applied in introducing teachers to the online assessment systems. This strategy will be important regardless of how useable and learnable a system is. Yuen and Ma (2008) commented that this step is crucial to build up teachers' confidence in using technology in general. Increased confidence will, in turn, increase willingness to use other forms of instructional technology in the future. Intuitively, more straight-forward user interfaces are likely to appeal to teachers with little prior experience in online assessment systems. However, with increased experience, these teachers may also be willing to use more sophisticated systems.

(ii) Provide effective ongoing professional development to assist teachers in the adoption of online assessment tools. Studies have shown that the most effective professional development programmes that improve teaching practices are those with activities that are ongoing and sustained over time (Tournaki et al., 2011). Besides providing professional development programmes, ongoing institutional support provision will also be essential. Buchan and Swann (2007) suggested a three-level support approach which includes real-time training and professional development, helpdesk troubleshooting, and self-help resources. High-quality technical support structures for different staff groups must also be readily available and accessible throughout the assessment periods.

(iii) Ensure that the additional initial learning requirements are factored into teachers' workloads. The extent to which this must be considered will vary in part with how well the system is designed (i.e., systems that are more 'learnable' will entail a lower workload commitment than those less so). However, this factor is likely to be a significant moderator of responses to the introduction of online assessment or any other technology-based tool. In the study by Amante et al. (2019), teachers cited reasons such as "extra time spent by teachers" and "additional effort to learn by teachers" for not using online assessment tools. Results of this kind underscore the importance of considering the impact on workload as a potential barrier to the introduction of online assessment systems.

(iv) Offer different levels of induction that can be tailored to the needs of individuals. As cited previously, some studies have highlighted significant relationships between age, experience and teachers' attitudes towards online assessment. These results suggest that different levels of support in the introduction of online assessment may be needed for different teacher cohorts. Again, the extent to which this factor needs to be considered may be a product of the learnability of the system.

(v) Include proctoring tools to improve examination integrity when implementing online assessment. Many educational institutions that implemented online assessment require the physical presence of the students in the examination process for supervisory reasons. There are already proctoring tools that allow online assessments to be carried out remotely, without requiring that physical presence of students (González et al., 2020; Selwyn et al., 2021). In the study by Hylton et al. (2016) on using webcam-based proctoring to deter misconduct in online examinations, it was revealed that candidates who were not monitored by a proctoring tool perceived to have experienced greater levels of opportunity to engage in examination misconduct than those who were monitored by a proctoring tool. As such, proctoring tools can be employed to add a layer of deterrence against the misuse of online assessment systems and counter deception and dishonesty during examinations. Milone et al. (2017) posited that from an instructor's perspective, there were benefits in using proctoring as compared to in-person testing. The physical space and invigilators needed for in-person testing are eliminated and the cost of the online proctoring is passed on to students. Hall et al., (2021) recommended that for educational institutions considering implementation of online proctoring, orientation should be conducted for both lecturers and students. This could take place as a mock examination to acquaint lecturers and students before their first remotely proctored examination. It was also recommended that technical support should be made available if any issue arose during the proctored examinations.

Universities need to manage the paradigm shift from paper-based to online assessment well for such implementations to succeed (Amante et al., 2019). At present, however, only a limited body of evidence exists to guide higher education institutions on the best approaches to achieve this goal, and in particular, on how teachers are likely to respond to these shifts. Further research into teachers' responses to online assessment, and into ways to overcome perceived barriers to its use in real settings, will be critical to ensure that its benefits are seen in improved teaching and learning outcomes. The extended UTAUT model proposed here may assist in integrating research within this important field, to ensure that the benefits of online assessment methods are harnessed fully within the higher education sector.

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A predictive study of students' social presence and their interconnectivities in the social network interaction of online discussion board

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Abstract

Effective online interaction is beyond interacting with whomever. The quality of social interconnectivity matters. Social presence plays a vital role in building an effective online learning community. This study empirically examined: how online social presence will predict various aspects of students' social interconnectivities (i.e., in-degree, out-degree, betweenness centrality, closeness centrality, eigenvector centrality, reciprocated vertex pair ratio, & PageRank) in the social network of discussion board within an online course? The predictive utility of social presence for all social network interconnectivity was supported, but reciprocated vertex pair ratio, so-called two-way interconnectivity was not. Social presence serves as a strong predictor for social interaction and interconnectivity. Learners with higher social presence are more likely to play distinguished roles of influencer, liaison, transmitter, social strategist, and prestigious figure of a community of learners. The findings would support online instructors to facilitate, guide, and support their students to navigate through the convoluted social interconnectivity effectively and continuously.

Introduction

If the COVID-19 pandemic rendered us alone and lonely, forging instructional and social community building can combat the pall to accomplish learning physically alone but together through collaboration and interconnectivity. Ironically, most students are drawn to social interaction on social networking sites, while unfamiliar with social interconnectivity in a learning context that values the effectiveness of with whom to interconnect to reach goals and the roles played in networks to obtain resources. The core tenet of online interaction is beyond interacting with whomever. In fact, with whom to interact and how to interact may determine whether or not one remains alone. The quality of interconnectivity matters. Effective online learning does not occur in a vacuum. Gunawardena et al. (2016) perceived a seminal claim that learning is not purely a cognitive process, but also is emotionally loaded and situated within a social context.

Social presence plays a vital role in building an effective online learning community. The effectiveness of a learning community has been explored extensively, resulting in a considerable body of literature about online social presence and online learning. Holme (2016) saw the need for research to expand the understanding from descriptive analytics, to predictive and prescriptive analytics. In other words, the knowledge acquired in building a community from descriptive research is in hindsight and insight only, rather than foresight. Predictive social learning analytics would take a more proactive approach to address the needs of the learning network. They help to understand and influence the present and improve ongoing learning processes. Previous descriptive studies in social presence and learning community were understood from students' attributes (i.e. genders, ages, skills), perceptions (i.e. motivations, experiences, attitudes, degrees of satisfaction) via self-reported data, and communication notes content analysis which served as a reactive approach to comprehend the past and by understanding derived from these discernments, educators intend to influence the future.

Social learning analytics is a new affordance to research social presence and social interconnectivity behavior in online learning networks and communities. The increasing prevalence of learning analytic technologies make interconnectivity behavior data available to researchers. Tirado, Hernando, and Aguaded (2015) contended social learning analytics does not replace existing analyses. However, it does offer additional powers to enable educators to detect learning network development and to empower them to nurture and improve community building. These profound discoveries would continue grounding and validating theoretical suppositions of building effective learning communities. These positions were strengthened by researchers (Alhadad et al., 2015; Arroway, 2016; Alhadad et al., 2015) that indicate predictive analytics are needed to understand online learning and instructions.

By examining social presence and learning community building in reference to the perspective of social interconnectivity as interaction behaviors would add an additional layer to support teachers and students to sustain a positive social presence and build viable online learning networks and communities. The knowledge in social interconnectivity is predictive, prescriptive, and proactive rather than descriptive, reactive, or hindsight. Prior research has thoroughly applied descriptive and diagnostic analysis to comprehend the relationships between social presence and the learning community by analyzing posting contents and measuring perceptions. Understanding social presence's predictive power would advance educators' knowledge, skills, and practices to promote personalized, but yet social and collaborative learning, to nurture students' ideal interconnectivity behaviors in the process of building a learning community.

This study empirically examined the following research question: How will online social presence predict various aspects of students' social interconnectivities (i.e., in-degree, out-degree, betweenness centrality, closeness centrality, eigenvector centrality, reciprocated vertex pair ratio, & PageRank) in the social network of discussion board within an online course?

Social Learning Community

Social presence

Social presence, defined as the ability of participants in a community of inquiry (CoI) to project themselves socially and emotionally, as real people through the medium of communication being used, is critical to understand social sense in a learning community. More specifically, it represents the degree of feeling, perception, and reaction of being connected by digital communication to another intellectual entity (Tu & McIsaac, 2002).

Social presence impacts learning

Research has documented how social presence induces learning impacts and how social presence interplays with learning outcomes. In an online discussion environment, Joksimovic (2015) attributed social presence as a predictor of students' final course grades. Their further inquiry showed social presence serves as an early detection of students at risk of failing courses. Derived from Topu's et al. (2018) study, social presence was not correlated with students' retention but was related to learning satisfaction and achievements (Cho & Tobias, 2016). Expectedly, social presence was found correlated with trust and learner-centered instructions respectively (Tseng et al., 2019). It should be noted that females with prior cyberbullying experiences are more likely to demonstrate a lower level of social presence, thus utilizing protective and equilibrated strategies of silencing and conflict avoidance coping in online discussion settings (Byrne, 2021). Furthermore, learning motivation was found a positive influence of social presence (Law et al., 2019).

Social presence impacts learning community

Online discussion activities are a commonly operated means to promote student comprehension of a topic

and to facilitate social knowledge constructions within a learning community building process (Cho & Tobias, 2016). Branching out from the impacts on learning outcomes, researchers propelled their investigations to the forefront in social presence and building social trust relationships in a collaborative learning environment (Tseng et al., 2019) in online discussion instructions. In fact, Oyarzun, Hancock, Salas, and Martin (2021) concluded the importance of social presence in building CoI amid the COVID-19 pandemic for online graduate teacher education instruction. More importantly, students with higher social presence are more amenable to collaborative activities and to manifest higher level of loyalty in online team activities.

Mokoena (2013) indicated effective discussion and social network interactions are increased by greater social presence. More specifically, sociability, social space, and group cohesion apply crucial weight with social presence (Akcaoglu & Lee, 2016). Xie's et al. (2017) research was driven by the meanings of an online learning community development through examining social presence, conflictual presence, and identity negotiation. Their interplay in digital learning networks is derivative of socially situated identity theory with discourse analysis. They noticed that students devised their social presence to function as facilitators and participants in the process of community development.

Social interconnectivity

Social interaction is an element of sociability while social interconnectivity is a deep-seated social fabric of learning networks and communities. Social network interconnectivity surveys the level of latitude and longitude threads to uncover how and whom learners connect with and to what degree to initiate networks to build learning communities and how networks and communities evolve. Hansen et al. (2011) concluded that studying network structure or social interconnectivity would create an advantage for educators to comprehend how students' social interactions and learning behaviors are impacted by learning network structure. Additionally, students' network positions may involve their accession of learning resources (Burt, 1995), and how students fashion their interconnectivity to shape their network and community structures. Understanding both social interaction and social interconnectivity pertaining to a structural perspective will galvanize educators into action to create an online learning community that is better poised to fashion effective online learning support for instructional improvement and to facilitate rapid progress of social interaction and interconnectivity.

Kent, Rechavi, and Rafaeli (2019) contended that examining social networks would elucidate learners' interconnectivity behaviors in learning networks and communities. Social network interaction goes beyond interaction frequency and numbers. It investigates interconnectivities via different network indices, such as betweenness, closeness, eigenvector, and PageRank centralities. Theses network indices indicates how learners connect, respond, receive, communicate, determine the quality of roles, and faclitate resource flow. Researchers drive their investigations to quality of connections, interconnectivity roles, and tasks to understand the development of a learning community. Building on the cognizance of social interconnectivity, researchers harness rivers of social interactivity to grapple with the community of learners (Rook, 2018), learning community building (Msonde & Van Aalst, 2017).

By observing the positions each student achieves in networks, social network interconnectivity reveals the social network roles they play with the strengths of their interconnectivity. Suthers (2017) proffered that social roles in interconnectivity denote communication values, meaning, goals, and expectations.

Applying different network indices, Feng (2016) and Adalat et al. (2018) identified conversation starters, influencers, active engagers, network builders, and information bridges by computing in-degree, out-degree, and betweenness centralities. Hansen et al. (2011) applied the combination of metrics consisting of a network metrics, participation metrices and visualizations to discern each individual's social roles and how they were connected. These roles were called question people, answer people, and discussion starters by using in-degree, out-degree, average degree of neighbors, and clustering coefficient. From a communication facilitation perspective, Kim, Wang, and Ketenci (2020) characterized three leadership roles, full facilitator, transactional facilitator, and attractive facilitator. Their further explorations showed these roles were related to students' behaviors, cognition, and emotions. The social role can be applied to observe online instructor's interconnectivity behavior. Ouyang, and Scharber (2017) found instructors migrated social roles from a facilitator, an observer, to a collaborator to meet the instructional practice needs over time. Yen et al. (2019) utilized different network centralities to identify network roles in an online learning community, such as liaison, transmitter, social strategist, prestigious. Furthermore, the predictive utility reveals that learners with higher self-regulated learning skills tended to connect to others based on flow and distance of the connections (betweenness and closeness centralities), rather than on how prominent (eigenvector centrality) and prestigious (Page Rank) their connections were. In Shan and Wang's (2021) recent study on social presence and online collaboration, based on social network analysis data, they found people who initiated the collaborations played three key roles in the discussions, creative idea sharers, resource providers, and problem solvers/advice providers. Nevertheless, such initiating act did not result in improving the process of high-level collaboration.

Chen and Huang (2019) conducted a series of network analyses to understand students' interconnectivity propensity. They noted that students in the high prestigious group (in-degree centrality) demonstrated higher quality connections with denser and stronger interconnectivity (closeness and eigenvector centralities) within their own network. Namely, they tended to interact with others who have similar prestige. Intriguingly, high prestige students did not hold discussion facilitation interests delved from their betweenness centrality which was not significantly higher than their counterparts who evinced connections with them but were not reciprocated.

The exploration of social interconnectivity can be extended from individual to network and community levels. Kent, Rechavi, & Rafaeli (2019) studied how offline social capital may impact online social interconnectivities by examining different network parameters, such as network density, network diameter, network clustering coefficient, and network modularity. It was concluded that offline social capital negatively impacted online social interactions.

Social presence and interconnectivity in learning community
Researchers began to probe how the social presence may pertain to social interconnectivity from a perspective of social network analysis in the context of a learning community. By using network centrality, Shea et al. (2014) concluded that social presence correlated with in-degree and out-degree centralities that indexed the incoming and outgoing interactions while Yassin et al. (2020) administered community density, as a social network community metric, to analyze how it is associated with social presence. Their findings revealed the students with higher social presence are associated with interaction intensity (network density) and their significant roles might be responsible for bonding networks and communities.

Researchers continued their examinations of relationships between different dimensions of social presence and various social interconnectivities. The interactive dimension of social presence was commonly found to be highly correlated with different centralities, such as in-degree, out-degree, betweenness, and closeness centralities. Satar and Akcan (2018) found the interactive facet of social presence is correlated with interactivity, prestigious role, and influence roles that were measured by degree, in-degree, and out-degree centralities. These findings coincided with Kovanovic et all's (2014) treatise that endeavored to understand the relationships between social presence and betweenness and closeness centralities. They found an additional three statistically significant correlations between interactive dimensions of social presence and betweenness, in-closeness, and out-closeness centralities while affective and cohesive dimensions of social presence showed weak or no correlations with network centralities.

Tirado, Hernando, and Aguaded (2015) discerned the positive relationship between in-degree and network cohesion that suggested students who received more responses tended to situate themselves in a central location with higher network cohesion power. They extended their examination with Sequential Equation Modeling and found positive influences of network cohesion and indegree on social presence, especially interaction and cohesion dimensions.

Owing to matured knowledge in social presence and the advanced social interconnectivity analysis, examining the predictive power of social presence on students' interconnectivities through network centralities is opportune. By fathoming social presence predictability, teachers are empowered to galvanize their instructions to build a more cohesive learning community by facilitating each step of interconnectivity that students embark on online discussion instruction. Knowledge gained from such examinations would lead to better practices of personalized learning and collaborative learning.

Method

Participants

Thirty-two graduate students (N=32) in an online educational technology course responded to an online survey prior to their participation in the online discussion board in a Southwestern U.S. four-year public university. One student did not respond to the survey. Most of the respondents were female (n=21, 65.63%), Caucasian (n=24, 75%), and aged from 26 to 45 years old (n=21, 65.63%). More detailed demographic information of the participants is listed in Table 1. The graded online discussions were instructor-led, asynchronous activities in which the students responded to the discussion questions posted by the instructor and others' postings.

Table 1: Demographic information of participants (N = 32).

Variable	Frequency	Percent
Gender		
Female	21	65.63
Male	11	34.37
Ethnicity		
Caucasian	24	75.00
African American	3	9.38
Latino	4	12.50
Asian and Pacific Islander	1	3.12
Age		
26 - 35	12	37.50
36 - 45	9	28.13
45 +	11	34.37

Measurement of research variables

Online social presence as the predictor variable

Online social presence was measured by the Computer-Mediated Communication Questionnaire (CMCQ) (Yen & Tu, 2008). In the CMCQ, there were 24 items on a 7-point Likert scale (i.e., 1 as strongly disagree to 7 as strongly agree) developed to measure a respondent's self-perceived intensity of online social presence in terms of (1) social context, (2) online communication, (3) interactivity, and (4) privacy. Total scores from 24 items (see Table 2) were used to measure online social presence in this study.

Prominence in social network of online discussion board as the criterion variables

Participants' social interaction in online discussion was analyzed via Social Network Analysis (SNA). SNA provided both quantitative (local and global metrics) and qualitative data (sociograms/network graphs). A reply from A to B was coded as one unique edge different from a reply from B to A due to the difference in the interaction direction. Both the local metrics of vertex and edges and global metrics of overall network structure were calculated. Then the network graphs of sociograms were created to get the visual bird's-eye views of the network.

Table 2: Questionnaire items of online social presence.

Interactivity
Computer-Mediated Communication allows me to participate comfortably in activities with other.
Computer-Mediated Communication allows me to communicate comfortably with my communication style.
Computer-Mediated Communication allows me to respond to messages in a timely fashion.
Computer-Mediated Communication allows others to respond to my messages in an acceptable time.
Computer-Mediated Communication allows me to participate comfortably when I am familiar with the topics.
Computer-Mediated Communication allows me to make important online contributions to activities involving others.
Social context
Computer-Mediated Communication allows me to convey feeling and emotion.
Computer-Mediated Communication allows me to carry on informal conversations.
Computer-Mediated Communication allows me to build more positive social relationship with others.
Computer-Mediated Communication allows me to build trust relationships.
Computer-Mediated Communication allows me to perform social interactions.
Computer-Mediated Communication allows me to communicate comfortably with one person or with multiple people.
Online communication
Time delayed Computer-Mediated Communication allows me to easily express and understand communications.
Real time Computer-Mediated Communication allows me to easily express and understand communications.
Text-based Computer-Mediated Communication messages are easy to understand and to express.
Computer-Mediated Communication allows me to communicate comfortably with my writing skills.
Computer-Mediated Communication allows me to use my keyboarding skills comfortably.
Computer-Mediated Communication allows me to be connected with others.
Privacy
Computer-Mediated Communication allows me to be assured that my private messages will not be forwarded to the public.
Computer-Mediated Communication allows me to be assured that my personal information cannot be obtained by others.
Computer-Mediated Communication allows me to communicate in a private and confidential way.
Computer-Mediated Communication allows me to reliably communicate to specific destinations.
Computer-Mediated Communication allows me to be assured of privacy if it is accessed from secured areas (Homes, Office, etc.).
Computer-Mediated Communication allows me to manage privacy.

Participants' prominence in the social network of online discussion board were measured by (1) in-degree, (2) out-degree, (3) betweenness centrality, (4) closeness centrality, (5) eigenvector centrality, (6) reciprocated vertex pair ratio, and (7) PageRank with the help of NodeXL Pro (Aldhous, 2012).

Degrees (in-degree and out-degree) are distinct measurements from frequencies. In-degree is 'the number of different individuals' from which one receives messages while out-degree is the number of individuals to which one replies. Contrarily, frequency is to measure 'the numbers of postings' that individuals conduct.

Betweenness centrality is a measure of the degree that a person is strategically situated between different networks. It purports the potential influence on the information flow between networks through both direct and indirect pathways (Friedkin, 1993). It can be used to identify a social role gatekeeper or a liaison. Closeness centrality observes the distance of connection and gauges the shortest paths to reach others more efficiently (Hansen et al., 2011). Higher degree of closeness demonstrates the role of an information transmitter, conveyor, and broadcaster.

Eigenvector centrality observes the quality and level of how individuals strategically connect to other more active or well-connected members (Zaki & Meira, 2014) (like prestige roles with higher PageRank). These roles are referred to as social strategists or strategic connectors. PageRank is the value to which a participant is connected (inbound connection) by other active participants (de Keyser, 2012). A person holding a higher PageRank score is perceived by other active participants (higher eigenvector) as more prestigious or as potent peers of prestige. Reciprocated vertex pair ratio is the ratio between ingoing and outgoing connections in directed connections. It is the proportion of vertices that have a connection returned to them. Higher reciprocated vertex pair ratio denotes a person engages in more two-way interaction.

Data analysis

Data analyses were conducted with IBM SPSS Statistics 24.

Linear regression analyses

The predictive relationship between the predictor variable of online social presence and each of the seven criterion variables was evaluated with linear regression (Cohen et al., 2003; Norusis, 2012).

Significance test

The F test of the R2 was conducted to evaluste the predictive relationship of interest with the .05 as the alpha level.

Effect size index

The R2 as the effect size index quantified the proportion of variance in a criterion variable by online social presence.

Results

Social network analysis

Inquiry of the online social network was accomplished through network metrics. Visual sociograms (see Figures 1-6) were created using the Frucherman-Reingold (Frucherman & Reingold, 1991) and the Harel-Koren Fast Multiscale (Harel & Koren, 2001) layout algorithms to identify structural patterns. The community (see Table 3) consisted of 33 learners, 1 instructor (vertices), and 487 total edges. Maximum geodesic distance was 2.00 while average geodesic distance was low (1.63), on the premise of Milgram Experiment's (1967) 6-step network distance. The community also exhibited a medium low level of connectivity (graph density = .24) that affirmed not all students interconnected with each individual while the community demonstrated medium interactive traits through two-way connections, reciprocated vertex pair ratio (.47) and reciprocated edge ratio (.64). Four distinguished clusters/networks were observed with low modularity (0.12) among them. Cluster 1 has the most students (12), while Cluster 4 has the least (4). Four networks have a wide range of reciprocated ratios that range from .14 - .80. Highly interactive networks (Cluster 1,

2, & 3) tend to demonstrate higher reciprocated interaction. It is noteworthy that despite low modularity revealed limited interaction among the emerged four networks, more than half of connections (262, 53.80%) were made as cross cluster interactions.

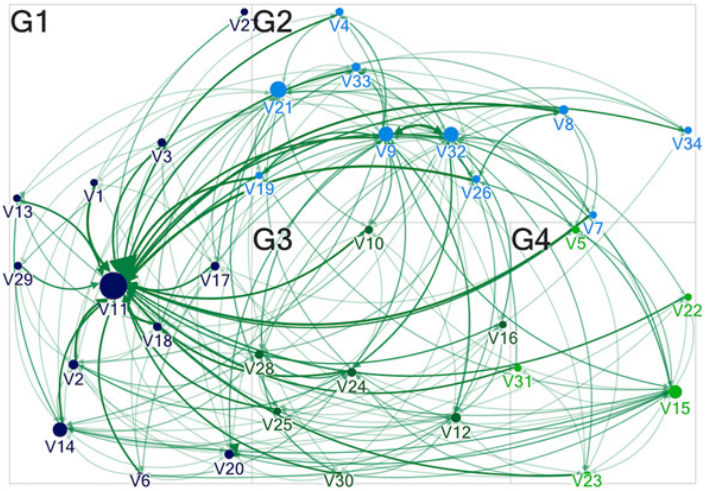

Figure 1: Clustered network. Note: the vertices were grouped by using the Clauset-Newman-Moore cluster algorithm (Clauset, Newman and Moore, 2004) and visualized in a network graph. The vertices were assigned with colors according to the clusters they belonged to. The vertex size is based on betweenness centrality.

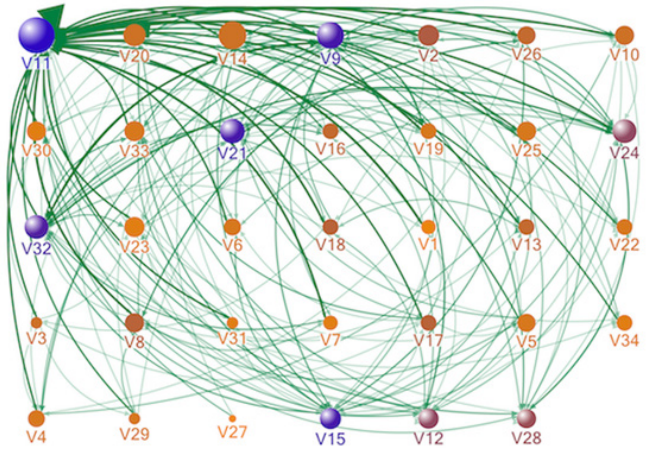

Figure 2: In-degree & out-degree centralities in a grid format layout. Note: vertex size is based on in-degree centrality. Vertex color and shape are based on out-degree centrality. The spear shape with blue color represent higher out-degree.

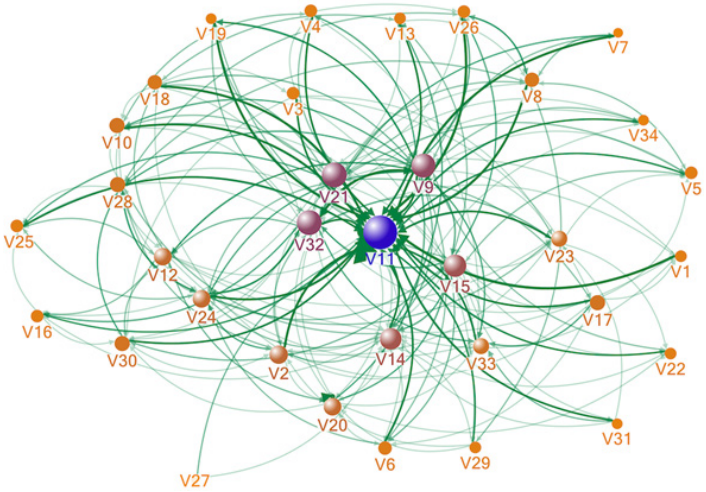

Figure 3: Vertex color-size & position based on closeness centrality in the Fruchterman-Reingold layout. Note: the vertex size and shape represent the degree of closeness centrality. The orange color and circle shape represent lower closeness centrality.

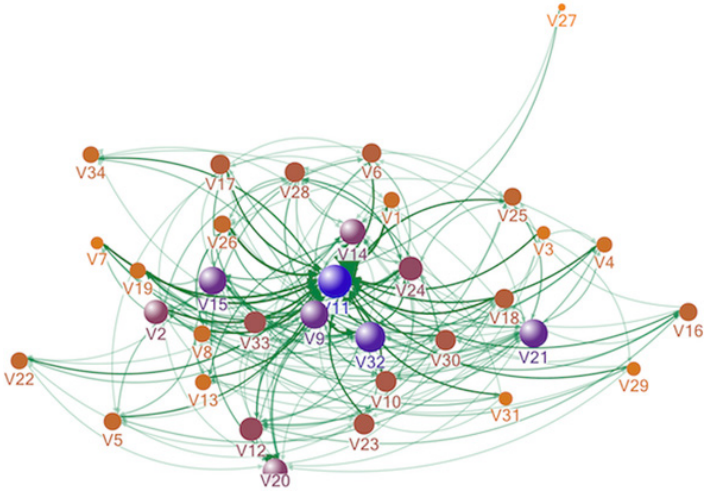

Figure 4: Eigenvector centrality based on the vertex color & size in the Harel-Koren Fast Multiscale layout. Note: The vertex color and shape represent the degree of eigenvector centrality. The blue-purple color and the spear shape represent higher eigenvector centrality.

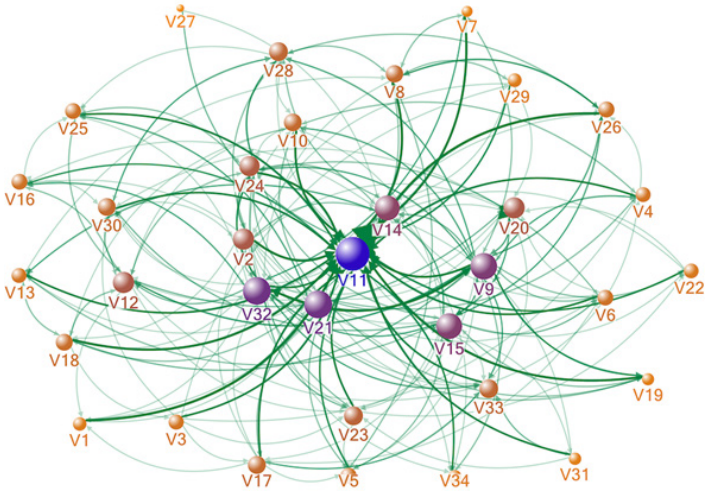

Figure 5: Vertex color-size and position based on PageRank centrality in the Fruchterman-Reingold layout. Note: the vertex color and shape represent the degree of PageRank. The blue-purple color and the spear shape represent higher PageRank.

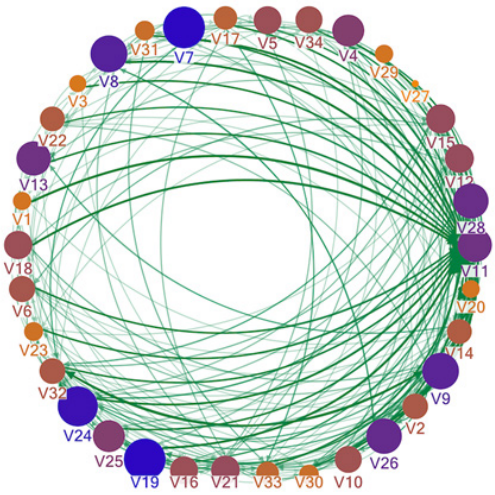

Figure 6: Vertex color-size and position based on Reciprocated Vertex Ratio in a circle layout. Note: the vertex color and shape represent the degree of eigenvector centrality. The blue-purple color and the spear shape represent higher eigenvector centrality.

The cross-cluster connections were examined further. More than one quarter of all outward (139, 28.54%) connections were conducted by Cluster 1 followed by Cluster 2's inward (109, 22.38) and outward connections (53, 10.88%) while the least was observed as Cluster 4 outward (25, 5.13%) connections (see Table 4).

Cluster 1 and 2 emerged as highly interconnected networks whereas Cluster 4 appeared as the lowest one (see Figure 7). Each cluster demonstrated distinguished and unique interconnectivity performances. Fashioning the same numbers of connections (edge = 172), both Cluster 1 and 2 manifested their connection preferences detected differently in cross-cluster inward and outward connections. In addition, Cluster 2 is distinct from Cluster 1 in liaison roles (size of the dots as betweenness centrality) that one participant dominated the inter-cluster information flow

Table 3: Global & cluster graph metric.

Metrics	Global Network	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Vertices	34*	12	10	7	5
Total edges	487	172	172	84	59
Reciprocated Vertex Pair Ratio	.47	0.37	.67	.54	.14
Reciprocated Edge Ratio	.64	0.54	.80	.70	.25
Maximum Geodesic Distance (Diameter)	2	2	2	2	2
Average Geodesic Distance	1.62	1.42	1.32	1.18	1.04
Graph Density	.24	.31	.44	.48	.40
Modularity	.12	-	-	-	-

*Thirty-three students and one instructor.

Table 4: Global cross-cluster direct (inward & outward) connections (total edges = 487).

Clusters	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cross-Cluster Inward Total
Cluster 1	123 (25.26%)	25 (5.13)	14 (2.87%)	10 (2.05)	49 (10.06)
Cluster 2	71 (14.58%)	63 (12.94%)	26 (5.34%)	12 (2.46%)	109 (22.38)
Cluster 3	38 (7.08%)	16 (3.29)	27 (5.54%)	3 (0.62%)	57 (11.70%)
Cluster 4	30 (6.16%)	12 (2.46%)	5 (1.03%)	12 (2.46%)	47 (9.65%)
Cross-Cluster Outward Total	139 (28.54%)	53 (10.88%)	45 (9.24%)	25 (5.13%)	487 (100%)

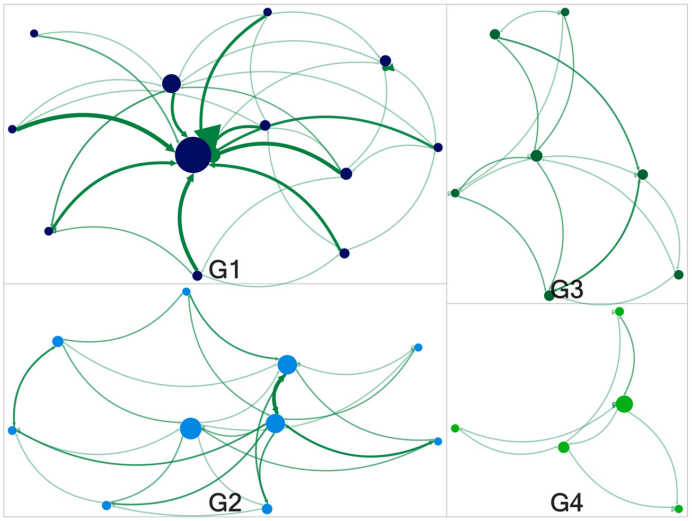

Figure 7: Four Clusters' internal interconnectivity with weighted edges. Note: G1: Cluster 1 & G2: Cluster 2. The size of the dots represents the strengths of betweenness. The color of the dots represents clusters. The width of the edges represents the degree of connections between two vertices.

while Cluster 2 depended on three participants, rather than falling one person. It should be noted that Cluster 3 and 4 lacked a dearth of liaison role to facilitate communication flows within the networks.

The further inquiry on the characteristics in internal cluster level elaborated unique insights. Figure 8 illustrated each cluster's interconnectivity preferences. Cluster 1 channeled almost three quarters (123, 71.51%) of its total connections

as internal which is the highest within all clusters that resulted in the lowest external connections (49, 28.49%). Contrarily, Cluster 2 devoted nearly two-thirds of its total connections toward external, Cluster 3 evidenced similar interconnectivity patterns. It is compelling to note that Cluster 4 appeared as the lowest in interconnectivity, but it tended to conduct the highest percentage (47, 79.66%) to connect with other clusters.

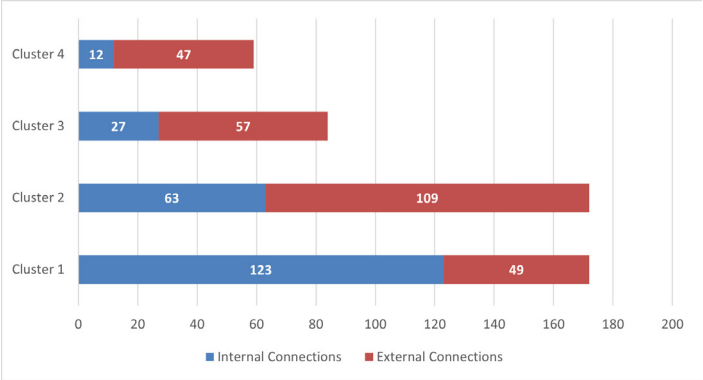

Figure 8: Cluster internal & external connections (total edges = 487).

Descriptive statistics of the research variables

The descriptive statistics of the research variables are listed in Table 5.

Table 5: Descriptive statistics of the research variables (N = 32).

Variable	*M*	*Mdn*	*SD*	*Min.*	*Max.*
Online social presence	133.50	137.50	19.50	98.00	168.00
Prominence in social network					
In-degree	8.44	8.00	6.00	.00	32.00
Out-degree	8.28	6.00	5.82	2.00	23.00
Betweenness centrality	23.39	7.66	49.65	.00	264.91
Closeness centrality	.02	.02	.003	.02	.03
Eigenvector centrality	.03	.03	.14	.008	.07
Reciprocated vertex pair ratio	.46	.41	.26	.00	1.00
PageRank	1.01	.85	.54	.30	2.81

Note: online social presence was measured with 24 questionnaire items on a 7-point Likert scale.

Linear regression analyses

All the relevant statistics from linear regression models with online social presence as the predictor variable are listed in Table 6.

In-degree as the criterion variable

The results supported social presence as a predictor for in-degree in an online social network, F(1, 30) = 7.67, p < .05, R2 = .20. Also, the positive regression coefficient of social presence suggested a positive predictive relationship between social presence and in-degree. Therefore, students with higher social presence tended to have more in-degree connections in online social network. Namely, the participants with higher social presence would receive more in-bound connections from other participants. The size of R2 suggested a predictive relationship of medium strength

Table 6: Seven simple regression models with online social presence as the predictor variable (N = 32).

Criterion variable	*F*	*df1*	*df2*	R^2	*B*
In-degree	7.67*	1	30	.20	.14
Out-degree	10.56*	1	30	.26	.15
Betweenness centrality	7.31*	1	30	.20	1.13
Closeness centrality	10.55*	1	30	.26	<.01
Eigenvector centrality	11.84*	1	30	.28	<.01
Reciprocated vertex pair ratio	.30	1	30	.01	<.01
PageRank	10.62*	1	30	.26	.01

Note. *F* = *F* test statistic; *df1* = regression degrees of freedom; *df2* = residual degrees of freedom; R^2 = squared multiple correlation coefficient; *B* = unstandardized regression coefficient.
*$p < .05$

(Cohen, 1988) and a 20% of variance in in-degree accounted for by social presence.

Out-degree as the criterion variable

Social presence was found to be related to out-degree in online social network, F(1, 30) = 10.56, p <. 05, R2 = .26. In addition, the relationship between them was positive according to the positive regression coefficient of social presence. Accordingly, students with higher social presence were expected to have higher out-degree in online social network in comparison with the participants of lower social presence. The R2 supported a strong relationship (Cohen, 1988) and a 26% of variance in out-degree accounted for by social presence.

Betweenness centrality as the criterion variable

The predictive utility of social presence for betweenness centrality in online social network was supported by the results, F(1, 30) = 7.31, p<.05, R2 = .20. The positive regression coefficient of social presence also suggested a positive predictive relationship between social presence and betweenness centrality. As a result, students with higher social presence were predicted to have higher betweenness centrality in online social network relative to the ones with lower social presence. Namely, higher social presence would play stronger liaison or facilitator roles. The size of R2 indicated a predictive relationship of medium strength (Cohen, 1988) and a 20% of variance betweenness centrality predictable by social presence.

Closeness centrality as the criterion variable

The predictive utility of social presence for closeness centrality in online social network was supported, F(1, 30) = 10.55, p < .05, R 2= .26. The positive regression coefficient of social presence also suggested a positive predictive relationship between social presence and closeness centrality. As a result, students with higher social presence were more

likely to have higher closeness centrality in an online social network. The participants with higher social presence would play a stronger role as an information transmitter role. The R2 supported a strong predictive relationship (Cohen, 1988) with 20% of variance in closeness centrality accounted for by social presence.

Eigenvector centrality as the criterion variable

The results supported a predictive relationship between social presence and eigenvector centrality in an online social network, $F(1, 30) = 11.84$, $p < .05$, $R 2 = .28$. Also, the above predictive relationship was positive. Therefore, the students with higher social presence would have higher eigenvector centrality in the online social network. Specifically, they were more likely to strategize their interconnectivity with more prominent or prestigious participants. The R2 also suggested a strong predictive relationship (Cohen, 1988) with a 28% of variance in eigenvector centrality accounted for by social presence.

Reciprocated vertex pair ratio as the criterion variable

The predictive relationship between social presence reciprocated vertex pair ratio in online social network was not supported, $F(1, 30) =. 30$, $p > .05$, $R2 =. 01$. The above finding was further corroborated by the negligible size of R2. Accordingly, the participants with higher social presence were not necessarily to engage in more two-way interconnectivity.

PageRank as the criterion variable

The predictive utility of social presence for PageRank in an online social network was supported by the results, $F(1, 30) = 10.62$, $p < .05$, $R2 = .26$. Furthermore, the positive regression coefficient of social presence suggested a positive predictive relationship. So students with higher social presence were more likely to have PageRank in an online social network. Namely, the participants with higher social presence were more likely to play prestigious roles in the networks and to be perceived by others as influential figures in the networks. The R2 suggested a strong predictive relationship (Cohen, 1988) with a 26% of variance in PageRank accounted for by social presence.

Discussions

The predictive utility of social presence for all social network interconnectivities was supported. Namely, social presence serves as a strong predictor for social interaction and interconnectivity. Learners with higher social presence more likely play distinguished roles of influential (in and out degrees centralities), liaison (betweenness centrality), transmitter (closeness centrality), social strategist or strategic connector (eigenvector centrality), and prestige with resources (PageRank) as an engaged and informed peer or a community of learners. They stress the quality of connections by interacting with others tactically in posting and receiving more discussion responses, linking different networks, connecting with more diversified people, and relating with prominent and prestigious learners. Students who demonstrate higher social presence would forge their social interaction and interconnectivity to build stronger connected learning networks and learning communities. This points out the importance of competency of students' social presence if the learning community is critical of online instruction. The ability to prepare students with competent social presence depends on instructional capacity that would enable students to harness their ability of social interaction and interconnectivity. The findings of this study can be deduced from three areas: 'social catalysts' as community learners; 'active, interactive, and diversified connectors' imbued with a 'sense of community.'

Social catalysts: Community learners & community learning
The students with higher social presence are more likely to perform as social catalysts that drive the evolvement of learning community and community learning. They extend the effectiveness of their social learning transcend themselves. Predicated on the power of betweenness centrality, learners with higher social presence serve as liaisons, are located in strategic positions and actively facilitate information flows through the networks. They tend to situate in a central location to ensure the information flow between or among different networks. Students with higher social presence marshal their interconnectivities to connect all class community members and to ensure the networks and the community are well resourced. The effect of interlinking different networks would promote a better community building and sustaining. In fact, when liaisons or connectors missing in a community, it created a structural hole (Burt, 1995), a gap between or among networks. The students with higher social presence are crucial to fuse different networks to build and to sustain a healthy learning community.

Paradoxically, despite their altruistic role, students with higher social presence also have been perceived by other network learners as prestigious figures (PageRank) who post meaningful and informative messages and perceived as resourceful students by their peer; therefore, others, particularly the ones (social strategists with high eigenvector scores) tend to connect to them. These students with comparative advantages hold impacting power on the level of the socially constructed knowledge in networks. This suggests that they tend to believe learning 'from' the community is as effective as learning 'with' the community by facilitating learning networks, videlicet, they are a community of learners. Students leveraged with higher social presence would likely fuse and catalyze the learning resources from different learning groups and networks that they receive and transform themselves into more innovative learners. Burt (2004) explained this phenomenon as "opinion and behavior are more homogenous within than between groups, so people connected across groups are more familiar with alternative ways of thinking and behaving…" (p. 349–50). In other words, to become better-resourced learners, these students shifted their thinking and behaviors from interaction to diversified and crossed groups and network interconnectivity.

Active, interactive, and diversified connectors

The higher social presence learners show a propensity of actively, and interactively interconnecting with more diversified network learners. They unify others and warrant that learning resources flow effectively and efficiently (closeness centrality). Learners with higher social presence are a community of learners who are aware of one another, and converse, communicate and interact actively, interactively, and strategically. In addition, they tended to be senders and receivers in responding to others more (out-degree) and received more postings (in-degree), but it's not necessarily a two-way interaction with the same people they responded to (reciprocated vertex pair ratio).

Furthermore, higher social presence can predict eigenvector centrality that concerns the quality of connections. These learners, as social interaction strategists or strategic connectors (eigenvector centrality), tend to discern to connect with more prestigious (PageRank) learners. To them, it's critical to establish relationships with prestigious people who will provide greater access to learning resources. They acquire strategic roles that strengthen networks and support network interactions through social dynamics.

Community sense

Students with higher social presence carry a broader sense of a learning community that is not necessary to be grounded in one-to-one interaction but rather in intricate many-to-many interactions and connections. This could be reflected in social presence and couldn't serve as a predictor for reciprocated vertex pair ratio that denote a ratio of mutual communication. The students made nearly half of interaction as two ways, while reciprocated vertex pair ratio and reciprocated edge ratio are .47 and .64. It should be noted that the Cluster/Network 2, a highly interconnected one with light blue circles in Figure 1, showed their reciprocated pair ratio and reciprocated edge ration as .67 and .80. Despite their highly interconnected nature, they did not reach an extremely high pair ratio (1.00). They underline the effective interactions as many-to-many interconnection which facilitates more organic network and community building ensuring that networks and community grow with all learners and all learners benefit from such beneficent social acts of camaraderie.

Implications

This study evinced that social learning analytics are attainable to understand imperceptible students' social interconnectivity in online learning networks and community. Previous research has accomplished diagonalizing what happened in online discussion activities. This study concluded online social presence is a strong predictor to detect students' social interconnective roles in an online discussion activity. Before online discussion activities proceed, instructors could survey and measure students' competency on social presence and foresee their possible social interconnective behaviors. The findings from this study would support online instructors to facilitate, to guide, to help their students to navigate through the convoluted social interconnectivity effectively and continuously, particularly just-in-time personalized supports that would facilitate individual student's rapid social interconnectivity progress while they monitor the discussion activity. Such power would lead to increased learning efficiency, effectiveness and better learning outcomes.

Limitation

The limitation of this study is that interaction data were obtained from online discussions. It does not include other digital communication, such as emails, real-time messages, and any other backchannel postings. Furthermore, the online discussion activities were required, graded, and instructor-led. The instructor facilitated the discussion on a regular basis to reflect the uniqueness of online instructional design and teaching.

Future studies

Future studies could fruitfully explore the development and the evolvement of learning networks and communities and how online social presence may moderate these evolvements over time. Such longitudinal studies could offer researchers further systematic inquiries on how students' social presence may facilitate online learning networks and communities may initiate, develop, sustain, or diminish throughout the entire instructional communication period. Obtaining these facts could serve as critical information for instructors to provide more effective and just-in-time support to each individual and community. In addition, future research should evaluate the potential effects of inter-social roles since humans play multiple social roles in a social learning context. Advantageous research questions for future research that can be derived from how cross-referenced social roles may be observed by students' online social presence? Moreover, future research should examine and cross-examine other predictor variables; e.g. cognitive presence, teaching presence, and different social network interactions, social network sites, and collaboration.

Conclusions

Online social interaction and interconnectivity are too complicated for any human to keenly detect due to their dynamic nature. This study noted the importance of social presence and its predictive power on social network interaction. The results would assist educators to develop a model to provide personalized guidance and support learners to navigate through digital network interaction. With these valuable data in hand, while real-time social network interaction data is collected, just-in-time personalization guidance of discussion activities could be delivered at any given point for learning adjustment and improvement. From a social learning analytic perspective, this knowledge and these skills in designing and delivering online discussion activities pave a new direction for educators in learning engineering and data-driven instructional design and teaching. Instructional designers and teachers should secure competent knowledge and skills in data-driven

decision making to address the dynamic and intricate human interactions and interconnectivity. This knowledge would permit educators to obtain better skills to benefit students in building a sustainable learning community. More specifically, online learning would no longer be a friendless endeavor. The impacts of COVID-19 on online, or remote learning will continually motivate educators to ask broader questions of the quality of social interconnectivity becoming part of contentious discussions.

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Reflections of a student engagement program designed and delivered by academics

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Abstract

Student support programs in higher education are commonly delivered by professional institution staff who are not directly involved in students' courses. In this paper, we report on a unique student support program within a School of Education and the perceptions of the academic staff who designed and delivered the program. Methodologically, written and spoken critically reflective encounters were used to explore dimensions of student support: connectedness, mindsets, self-management, academic capabilities, and professional identity. We perceived the program positively influenced some students in developing feelings of connectedness, building self-management skills and understanding commitment, and in establishing a foundation for a student experience that fosters a pathway towards a teaching career. Tensions were revealed relating to the ethical responsibilities of supporting all students to continue study and staff's own personal study experiences were found, at times, to contribute to assumptions about how students should engage with study. Findings suggest that addressing student needs across the dimensions first necessitates a shared understanding of what constitutes student success and how this is interpreted within a support program. Assisting academics in gaining deeper insight and understanding of what it means to be a student, particularly an academically vulnerable student, was a benefit of the program.

Introduction

Beyond the interactions experienced as part of teaching and learning, there is restricted scope for academic staff to provide what might be considered personalised support and pastoral care to university students (Groccia, 2018). Historically, the role of academic staff was to provide quality teaching, learning and assessment opportunities for students (Akareem & Hossain, 2016; Oonk et al., 2020), however, in contemporary higher education contexts, it is becoming increasingly common for academic staff to support students with both their academic and non-academic challenges (Crawford & Johns, 2018). While existing research has investigated student and institutional perspectives and experiences of student support and engagement initiatives (Balwant, 2017; Bowden, Tickle, & Naumann, 2019; Nepal & Rogerson, 2020; Tai et al., 2019), there is an absence of research on the experiences of academic staff in the design and delivery of student support programs (Chipchase et al., 2017; Coleman et al., 2021; Crawford & Johns, 2018). Against this background, an engagement program targeting students identified as academically vulnerable was designed and implemented by four teacher education academics - the authoring team - at a regional Australian university. In this paper, we report on our perceptions of student support and how the program was able to enable student success.

The program supports students with engagement and achievement in their studies and provides individualised support by program staff. The principles underpinning the design of the program were: targeted communication between academic staff and students (O'Shea et al., 2016); mutual agreement between academic staff and students about approaches to study; the establishment and reinforcement of student responsibilities (Tinto, 2017); methods to establish and support student accountability (Cook-Sather, 2010); and considerations of student wellbeing (Boulton et al., 2019). Here we aim to understand, from the perspectives of the academics involved in the program, what success might look like in the context of engagement and effective retention of students. Using an evaluative framework for student learning services proposed by Lane et al. (2019), the research was guided by the question: How does our academic support program support academically vulnerable students? This question was divided into three sub-research questions:

1. How do we, as academics, conceive of student success?

2. How do we understand the ways in which the program contributes to the success of academically vulnerable students?

3. Where do we identify gaps in how the program is able to support academically vulnerable students?

Given the changing landscape of university approaches to teaching and learning, as well as the multiple challenges encountered by 'modern day' students (Tight, 2020), achieving, and maintaining, student engagement has become a critical focus for Australian universities. With this focus, many universities have established programs and initiatives specifically designed to enable student retention which incorporate targeted benchmarks or outcomes (i.e., less than 10% attrition of first year students) (Crawford & Johns, 2018). We anticipate that the challenges, surprises, and accomplishments explored in this study may inform and guide future approaches to student engagement and retention in the higher education sector.

Literature review: Understanding student success

Academic success and study completion in higher education were once perceived as the responsibility of the student alone (Crosling, 2017). By contrast, in the current academic climate, it is typical for universities to provide a range of student services, educational processes and programs underpinned by inclusive approaches that acknowledge student diversity, unique backgrounds, and situational experiences. This reflects a paradigm shift whereby universities are focused on student retention and are expected to share the responsibility with students for academic success, persistence, and study completion (Crosling, 2017). In response to pressures surrounding student retention, universities have incorporated a plethora of programs and interventions designed to provide support and services, and to foster a positive student experience, which are ultimately premised on the motivation to keep students engaged and studying. Such approaches are variable and institution-specific, but often are formulated, administered, and monitored by particular engagement and retention staff and teams at an organisational level (Roberts, 2018). Although the utilisation of university-wide engagement and retention teams allows for organisational control and monitoring (Scott et al., 2008), major limitations of these approaches are that student individuality, understanding of personal circumstances, and awareness of course of study are not closely valued or understood. In addition, these programs often preclude academic staff and, thus, can be limited in addressing course-specific academic needs.

Tight (2020) draws attention to the increasing focus on retention and engagement in the higher education sector, suggesting that economic rationales for maintaining student enrolments largely drive institutional interest. Student retention, for example, is often included in the institutional statistics produced for universities as a/n (poor) indicator of educational quality. Student attrition influences an institution's university ranking, and financial implications can result according to attrition rates (Burova, 2016). In his systematic review, Tight (2020) demonstrates how the terms 'engagement' and 'retention' have increased in frequency over time as a topic of research literature but argues that only focusing on these aspects results in reductionist and narrow interpretations of students, rather than holistic and experiential understandings of what it is actually like to be a student studying today. Tight's (2020) critique aligns with Weuffen et al. (2018), who challenge narratives of student retention and engagement because of their deficit focus. Similar to Tight (2020), they suggest that discourses should emphasise student success in terms of holistic wellbeing instead of narrow indicators of academic achievement and engagement.

While discourses of engagement and retention remain contested, both in terms of institutional motives, and in the implied deficits of students (e.g., as responsible for the inequalities and challenges they face [McKay & Devlin, 2016]), they have served to increase support and services for students on-the-ground. It remains most common for institutions to support students through services that exist in parallel to curricula and learning activities, even though research suggests that the relationships students form with academic staff are significant in shaping their university experiences (Xerri et al., 2018). In this study, we explore how a retention and engagement program designed and developed specifically by academic staff, supported students identified as 'academically vulnerable', defined as students who failed 50% or more of their units (a full-time load of 40 hours equivalent equates to four units) in any one semester study period.

The Academic Support Program

The Academic Support Program operates in the School of Education as a re-engagement and retention initiative. The program has operated for more than three years and has involved up to 50 students at any one time. Once identified as 'academically vulnerable', a note is placed on students' academic transcript formally detailing their status as 'conditionally managed', and for the following study period, they are restricted to enrolling in a maximum of three units (i.e., 75% of a full-time study load). Students are contacted by the Director of Student Engagement or a member of the Academic Support Program team to discuss support options.

The aim of the program is to return students to a 'healthy academic standing', defined in the program as a student who successfully passes all enrolled units in the subsequent study period. The program includes a small team of teaching academics whose role it is to provide students with additional personalised support to engage in study. The team is led by Charlie, who is the Director of Student Engagement in the School and has been involved in learning and teaching in higher education for over 15 years. Other members of the team include Kai, a lecturer specialising in equitable education with 10 years' experience in higher education teaching; and Rowan and Blake, both lecturers with more than 5 years' experience in higher education teaching and 10 years' experience in secondary school teaching.

In practice, the program involves the identification of students by the central academic division. The central division then passes on student details to a nominated academic from within the relevant disciplinary school - in this case, the School of Education. Students are then allocated to a member of the Academic Support Program team, whereby team members are assigned a maximum of ten students to work with over a thirteen-week semester.

Contact is initiated by the team member via email, with follow-up phone calls made as required. Students are expected to meet, ideally face-to-face, with their assigned academic to discuss their conditionally managed status. These conversations are designed to ideally focus on what strategies and supports students may require to succeed (i.e., achieve a pass standard) in currently enrolled units. The strategies and support offered by the Academic Support Program team vary depending on the students' perceived needs. While the program is designed with flexibility to enable adaptive and personalised support approaches, the strategies and approaches applied are informed by relevant literature and evidence (Bartimote-Aufflick et al., 2016; Cook-Sather, 2010; Lane et al., 2019; Prochaska & DiClemente, 1983; Strayhorn, 2016; Tinto, 2012, 2017).
In general, students will meet with their nominated team member twice throughout a semester with regular (fortnightly) email or phone contact. These meetings may involve students discussing assignments they have due and how they are managing their time to complete them. A regular strategy in the program is for students to be encouraged and supported to create a study plan in order to visualise and more effectively manage their time. Students remain in the program until they have returned to a healthy academic status.

Dimensions of support for learning framework

In 2019, Lane et al. proposed a framework for evaluating the effectiveness of support for student learning, through which they identified five student-centred dimensions. In this paper, we utilise Lane et al.'s (2019) framework to critically reflect on how our academic support program works to support students.

The 'dimensions of support for learning' framework was developed to guide the evaluation of university initiatives designed to support student learning. While Lane et al. (2019) provide the tool as a means of evaluating programs from the student perspective, we have used the framework to consider from a facilitation perspective, how a program was perceived to align with the different dimensions. This offers a novel application of the framework, in that it enables the exploration of how facilitators (in this case, academic staff) understand and conceive of their roles in relation to aspects of the student learning journey identified as important. The framework, synthesised from a literature review of more than 330 academic research outputs, as well as consultation processes with institutional staff and students, identified five student-centred dimensions vital to supporting student learning: connectedness; mindsets; self-management; academic capabilities; and professional identities. Each dimension is described briefly below.

Connectedness

In the context of students, connectedness reflects a sense of belonging to their institution of study, with their discipline, their course, and to their peers. It includes the establishment of networks through the development of productive relationships with staff, other students, with industry professionals and others relevant to the student's learning. In addition, collaboration skills are identified in enabling connectedness, including interpersonal skills, teamwork and through supporting others.

Mindsets

Mindsets refer to the beliefs that people have in regard to self and others. In the context of student learning, mindsets relating to curiosity, sense of purpose, self-belief, and self-determination were identified as important to student learning. Lane et al. (2019), in reference to Dweck (2006), highlight how having a growth mindset assists students to understand that their knowledge and skills can be developed, which contributes positively toward motivation.

Self-management

The dimension of self-management recognises the imperative for students to "build their own learning strategies within their personal, work and study lives" (Lane et al., 2019, p. 960). It relates to the skills and abilities students practice to support their learning, such as strategic thinking, time management and priority and goal setting.

Academic capabilities

The development of academic capabilities relates to the knowledge and skills of a student's area of study as well as generic skill development. This dimension recognises the course content skills that students require and are exposed to through curriculum, which are often associated with occupational requirements. However, academic capabilities also relate to transferable generic skills such as numeracy, editing, critical thinking and communication; skills likely to assist students both while studying and in their everyday lives.

Professional identity

The dimension of professional identity refers to the need for students to find and use information about career paths, prepare for gaining work and to develop a sense of belonging to a professional body. Developing their own capabilities of the career-building process is one way that students can be supported to develop capacity in this dimension (Lane et al., 2019).

Method

We use collective narratives gathered through self (written) and collaborative (spoken) reflective encounters to explore how dimensions of student support (Lane et al., 2019) were embedded in our academic support program. While we explore our experiences of one program, we contend that learnings may be transferable to other institutions endeavouring to find innovative ways of supporting students identified as vulnerable or at risk.

We recognise our research to be an insiders exploration (Brannick & Coghlan, 2007) situated within a social, cultural, economic, and political organisational context; the University (Kincheloe, 2005). In this work, we position ourselves within an interpretive paradigm (Brannick & Coghlan, 2007) and emphasise that our understanding of the phenomenon - the academic support program - critically reflects the underlying meanings, purposes and interpretations of our thoughts and reflections (Morehouse, 2012). In interpretivist research, the aim is not to identify 'truth', but rather to understand phenomena from a subjective lens, recognising this as one of many possible understandings.

To methodologically ground our inquiry, we draw on the works of Fook and Gardner (2007) to inform our understanding of critical reflection and on Pässilä and Vince's (2015) work in using critical reflection within groups of people to support organisational learning and change. Fook and Gardner (2007, p.14) note that "critical reflection is a process (and theory) for unearthing individually-held social assumptions in order to make changes in the social world". In this study, we reflect on our assumptions about supporting students with the intent of improving how the academic support program is structured to assist academically vulnerable students in the future. Fook and Gardner (2007, p. 14) go on to say: "reflection is more than simply thinking about experience. It involves a deeper look at the premises on which thinking, actions and emotions are based". Pässilä and Vince (2015) suggest that critical reflection can be a process used collectively to promote learning and change. When engaging in collective reflection, Pässilä and Vince (2015) suggest there are opportunities/tensions in exposing individuals' experiences as well as opportunities to identify differences between organisational objectives/process and everyday practice. Through collective reflection, it is possible to reveal organisational norms and for new practice approaches to emerge (Pässilä & Vince, 2015).

Similar to collaborative autoethnographic methodologies (Chang et al., 2013; Guyotte & Sochacka, 2016; Lapadat, 2017), we acknowledge the importance of the ethics of our research and recognise that collaborative, critically reflective research is not without ethical considerations. We have adopted ethical principles in the conduct of the research through seeking voluntary consent to participate, de-identifying reflections and conversation transcripts and preserving participant confidentiality by applying gender-neutral pseudonyms (Beasy et al., 2020).

In this study, the authoring team individually created a series of written reflections about their experiences and expectations of the program which were then shared among the team prior to participating in collective reflective conversations. The first reflective writing piece was written one week before the program commenced; the second, six weeks into the program; the third, one week after work with students had ceased; and the fourth, two weeks after work with students had ceased. Each individual reflective writing piece was guided by a provocation, shown below, and numbered accordingly:

1. What are our expectations of ourselves and students in the program and how will we know what success looks like?'

2. How are we working with students and what is shaping our practices?

3. What have been our highlights/lowlights of the program and how have we been challenged? And, in what ways do we perceive that the program contributed to student success?

4. How did the dimensions of support for learning feature in our work with students in the program?

Critically reflective conversations were held by the team in the same week that the individual writing was prepared. Sharing each team member's written reflection ahead of time allowed for the preparation of questions and queries about each other's experiences of the program to be raised during conversations. Each reflection was approximately 500 words in length and each conversation lasted approximately 60 minutes. Conversations were conducted over Zoom and recorded. Recordings were transcribed verbatim using transcription software. All data were collated in NVIVO for deductive thematic analysis using Lane et al.'s (2019) framework as well as inductive coding of any additional prominent themes that emerged in the data (Guest et al., 2011). Coding was initially completed by the first author, before cross-checking was conducted by the second author to ensure consistency and reliability of the codes (Guest et al., 2011). The coded data was then reviewed and discussed in subsequent whole team meetings. To organise our findings, we first present interpretations of student success revealed through data collected, then present relevant findings in relation to Lane et al.'s (2019) dimensions of support for learning framework. In the text, abbreviations are used to identify by who, when and how data was collected e.g., 'Blake GC1' refers to data generated by Blake during the first group conversation (GC); 'Rowan WR3' refers to data from Rowan and their third individual written reflection (WR).

Findings

To interpret findings, we understand it is first important to explain how we conceptualise success, including student success and program success; presented below. In proceeding sections, we present findings related to each of the support for learning dimensions (Lane et al., 2019). We note that some dimensions were more apparent in the data than others; a finding that we discuss later in this paper.

It was found that, collectively, the team had similar ideas about what constitutes student success; however, differences were observable among the team in how success was understood within the program. Rowan's reflection, for example, highlights a tension within the program: "If students return to a 'healthy academic status by the semester's end, we could consider our job done but again, we were not encouraged to expect this for every student". While the aim of the program is to return students to a healthy academic status, Rowan identifies an 'accepted reality' from within the team that assuming all students will progress positively towards improved academic engagement and performance is unrealistic. The aim of the program also raised ethical dilemmas for the team – "What if we assist students to obtain a university degree preparing them for a profession that we suspect they will not be able to conduct?" Blake discussed how this raised the tension between supporting students and doing "what's in the best interests of the person" which questions our duty of care as professionals and as representatives of the institution.

A point we came to frequently discuss was the difficulty in measuring success, both of the program and of ourselves. We deferred to quantitative metrics (i.e., passing of units) as indicators of program success alongside qualitative metrics including student feedback on the impact of the program. We all agreed that program success would include "increased engagement, an excitement about joining the teaching profession, [and] a strong commitment to trying to become the best teacher they can be" (Blake). Having explicit conversations as a team about how to effectively measure the program's success highlighted our interest in ensuring more than just academic engagement. Rather, we were aware of the need to support students to build a professional identity as a teacher. At times, however, this pursuit brought into question our ethical responsibilities as teacher educators and university employees.

Contributions to the Dimensions of Support

Connectedness

Lane et al. (2019) identified three elements of connectedness; sense of belonging, networks, and collaboration; as being vital to student support programs in higher education. Our reflections suggested that our program addressed two of these elements; a sense of belonging and networks, though, our perception of the program supporting students in developing a sense of belonging was limited. For example, reflections revealed that at times, we were encouraging students to critically reflect on their place within a course, to think about their sense of belonging and to consider if teaching was the right career choice. Data suggested that this guidance was motivated by our own levels of care for students:

> Look, you need to rethink where you want to go with your career. Or I'm not sure that teaching is the best option for you at the moment. I have said that. That's because I care for them (Charlie, GC2).

In this way, it could be suggested that we were attempting to establish a connectedness to us as mentors but not necessarily a connectedness within their chosen profession. Findings also revealed the team's attempts to strengthen the connection between students and the institution and that our relationships with students seemed to assist in doing this:

> I thought it was really interesting that I think in all of our reflections we talked about how our role facilitated a connectedness to the institution that perhaps was previously lacking...on reflection, it also clearly shows that I was almost, you know, an ambassador for the institution as well, that I perhaps, hadn't really thought about before (Blake, GC4).

As a group, we reflected on the significant disruptions experienced by students during 2020 and considered how these had influenced students' sense of belonging. There was the perception among the team that social distancing during COVID made it difficult to connect with students generally and this contributed to students' lack of a felt sense of belonging to the institution and to the teaching profession. However, the connection with academic staff in the support program was seen as a way of supporting students' sense of belonging, "potentially, you might be the only relationship that the student has at university, or we might be" (Charlie, GC2).

While the professional connection to an academic staff member was perceived as a defining feature of the program – i.e., enabling students to access advice and support from academic staff outside of their enrolled units – these connections were most successful when a relationship was established:

> I was able to develop relationships with a few of the students I was supporting, all female, and these relationships tended to succeed because they recognised me as a support person – someone who 'had their back' and someone they could reach out to for advice. These students weren't afraid to be honest with how they were progressing and when things were hard or they had missed a deadline, they told me (Kai, R2).

Overall, reflections suggest that the program supported students in developing connectedness, though this was inhibited by the conditions of isolation created by COVID. Furthermore, data revealed that the program itself was a form of connectedness for students with the institution that was especially valued when relationships with program staff were established. Developing professional and personal relationships cultivated value and meaning for the students and formed a solid foundation for establishing and building a sense of connectedness.

Mindsets

Reflections revealed that, in order to support students to develop a growth mindset (Dweck, 2006), program staff had to challenge their own assumptions regarding the mindsets that students would have when entering the program. In many ways, our collective narratives revealed some misguided assumptions that the students we were supporting may hold similar mindsets to our own when we were students.

> I held the belief that all students prioritised their university studies and dedicated themselves professionally to developing as a pre-service teacher. This belief was based on university commitments taking priority over obligations such as employment, sport, and social endeavours...that students will be treated as independent learners and adults (Charlie, R1).

> So, I went in with very much an academic student support mindset. I now realize there are other things going on which mean that it can't just be academic support (Blake, GC3).

At the same time, the team reflected on the difficult work of challenging students' mindsets and some of the ways they would do this within the program. It was revealed through group conversations that often staff would take different approaches. Charlie approached challenging students' mindsets through reminding them of university expectations and the necessity to take responsibility for learning i.e. "If a student I work with comes in with that mindset and is non-accountable then I'm gonna be hard on them" (Charlie, GC1). Kai approached similar situations by reminding students of the broader context of university that influences student engagement and success:

> So many of the students I talk to say, 'I'm not very good at university', 'I can't do it', 'I'm just not good enough'. I try to remind them that university is only one way of understanding the world, and that we need to separate ourselves personally from the work we are doing professionally – learning to become a teacher (Kai, R2).

Reflections suggest that the work of supporting students in developing a growth mindset occurred in one-on-one conversations between staff and students. The strategies were perceived most successful when conversations occurred in person or over the phone. For example, Kai mentions the explicit strategies she employed when working with students:

> For the students that I developed the best working relationships with, this [mindset] was the area I felt I was able to make the biggest contribution. I maintained a strengths-based approach and worked to ensure students understood that I believed in them. I had explicit conversations with students about developing a positive self-perspective and spoke about strategies they can use when they catch themselves using negative self-talk (Kai, R4).

We found that in-person, phone, or online personal communication provided effective environments for students to express their perceptions of their study engagement and performance, and often allowed for staff to ascertain individual student mindsets towards their academic situations. Engaging in this communication enabled staff to gauge the mindsets of students, discuss what contributed to these, and work mutually to develop strategies to construct growth mindsets based on positive thinking. A key element of this process was staff exhibiting and communicating belief in these students.

Self-management

Students enrolled at university are predominantly categorised as adults based on their age. As such, academic staff typically adopt the perception that what comes with being an adult is a level of independence towards learning,

a level of responsibility to seek and engage with learning opportunities, and the capacity to self-manage a structured approach to meet the demands that university study necessitates. However, reflections revealed that students in the program regularly faced challenges outside of study skills, related to work commitments and caring responsibilities, challenges which made self-management more complicated than we may have first perceived and had not considered. What is more, we found that the extenuating circumstances of COVID-19 meant that our work with students involved many conversations about social, emotional, and mental wellbeing:

> If I had to describe the communication and engagement that I had with students during 2020 there was more time devoted to the mental, emotional, and social factors that influenced students rather than discussion directly about academic performance (Charlie, R3).

> Students' wellbeing and financial stability has had to be their number one concern and study has inevitably had to take a backseat for some (Blake, R3).

> I thought I could offer practical advice around writing, reading, and upskilling those academic skills. But really, what I ended up offering most of the time was empathy, understanding, and some tips and tricks around time management (Kai, R2).

Common across our approaches in working with students was a tendency to model the strategies we were supporting students to develop. We found this an effective strategy but does imply a close working relationship with students is needed for it to be effective.

> I found often I would be having conversations about helping students to identify strategies for themselves of when they might need certain, you know, support or how to do self-management better, not so much what the self-management is, but rather, how is it that you can access that? or What does it look like for you when you're in need of help? or How will you know, when you've reached a point that you need an extension? (Kai, GC4).

Findings revealed that often there is a disjuncture between the academic staffs' own the personal experiences of university studies and the students whom they support. Evidence from the reflections suggests that, as an academic group, our views on students' capacity to self-manage were embedded in how we approached our previous studies as students, and also in how we approached our current work, family, and external commitments. Nevertheless, much of our work with students centred around self-management skills related to difficulties in prioritising multiple commitments and subsequent study engagement and performance.

Academic capabilities

A challenge for us as academic staff in establishing relationships with academically vulnerable students was that they were not always receptive in recognising that they needed support, or in accepting support when offered. On occasions, students were uneasy or uncomfortable in identifying what areas of their academic skills and conduct needed development and tended to be reluctant to target academic capabilities and associated strategies that required advancing.

> I came into this role thinking that students would need support in developing the academic and institutional capital they require to successfully engage with study – I think this is true for some students, but not all. And my ability to influence this, I found, was pretty limited (Kai, R3).

Several experiences with students revealed that academic challenges were not always directly correlated to low level academic capabilities. Rather, limited self-management skills contributed to a lack of willingness to enhance academic capabilities, and directly towards the extent of academic engagement and performance.

> … student honesty really seems to be something that makes a difference to how it is that we can be supporting students. When there isn't that honesty, it's really difficult to then be able to navigate forward, how best to be approaching that support (Kai, GC2).

> I noticed was that both of us [Rowan and Kai] were talking not about helping students with their assessment, but rather helping them interpret and actually make sense of what they needed to do, which is about that academic capital, that students seem not to have a way of being able to make sense of this foreign academic language that's thrust upon them once they arrive at university (Rowan, GC4).

Blake suggests that as an academic, they are likely most skilled in providing support related to developing students' academic capabilities, yet "This turned out to be the dimension in which I think I had the least impact! I feel like the students I had weren't yet at a stage where they could engage with academic skill development." (R4). This raises questions regarding the necessary skilling of academics in supporting students in a program such as this. Furthermore, these experiences demonstrate that greater education around the role and purpose of the academic support program need to be clarified early in establishing the staff-student relationship, and an agreed willingness to be open and honest may facilitate a more constructive approach to academic capabilities.

Professional identity

Overwhelmingly, the ways in which professional identity was articulated within the data revealed a concern for the ability of students to be successful teachers and the duty of

care that our university has to support individuals engaged in studies. Despite our understanding of the importance of professional teacher identity, there were multiple occasions when each of us was apprehensive about supporting specific students in their desired choice of career direction:

> In terms of my own reflections on this program, the dimension of professional identity dominated my thinking. I kept wondering whether the students I was working with (who had some challenging social/emotional issues and difficulty with time management and resilience) were going to be able to become successful teachers (Blake, R4).

At times such thoughts contested our professional values, ethics, and subsequently our approaches in working with students, particularly when these approaches were grounded in fairness, equity, and positive student outcomes. Moreover, it was hard to dedicate focus to short-term solutions to study problems and not consider the long-term sustainability of our support and future careers of the students.

> We seem to be focusing a lot on the student and the attributes that make students successful. You know, we know that the system itself privileges a certain subset of characteristics that really come from middle class origins and those that have had these sorts of skills from a very young age. What we also know is that our universities want to have more diverse people coming into them. Secondly, we also know from teaching and teachers we need to diversify, you know, the teachers that are out there as well. My rebuttal there, in a sense, would be how do we actually navigate the system that we have to try and cater for the diverse people that we're coming into contact with... So I just wonder, where does that leave us? Where does that leave us in the roles that we have in supporting students? And... points around duty of care, and just that tension between support and actually doing what's in the best interests of the person, really come to play (Kai, GC2).

Although the best interests of each student were at the forefront of the support we administered, it was not uncommon to compare the observed academic conduct of these students at that time to how similar professional conduct in an educational environment might appear in the future. We found ourselves doing this regularly with a mindset relevant to duty of care and teacher readiness. Despite these patterns of thought, our collective priority was to encourage student engagement, assist them in their academic journey, and to optimistically contribute to a student experience that prepares these students for a teaching career.

Discussion

This paper sought to add new insight regarding university student engagement and retention by considering a perspective sparsely represented in the literature: that of the teaching academics involved in student support programs. Student retention has long been a priority for universities, but the COVID-19 pandemic, an increasingly diverse student cohort and a changing understanding of student retention and institutional responsibility, has seen a growth in programs focused upon engagement and retention. These programs are diverse, like the students they aim to support, making evaluating their effectiveness challenging. What is more, the success of these programs is likely to be defined differently by individual schools and universities, the staff involved and the students themselves. Guided by Lane and colleagues' (2019) evaluative framework for student learning services, we discuss our findings to consider the strengths of one academic support program, as well as its gaps, and reflect upon whether our understanding of 'success' may have impacted upon these.

One of the greatest benefits of the program perhaps, given our collective reflections, was its capacity to assist academics in gaining deeper insight and understanding of what it means to be a student, particularly an academically vulnerable student, in the current higher education landscape. Findings suggest that we typically felt we were able to support students across the five dimensions; connectedness, mindsets, self-management, academic capabilities, and professional identity; but became increasingly aware that this capacity was reliant upon establishing a solid relationship with students, a relationship often hindered by their complex lived experiences. In this way, as found elsewhere (Crosling, 2017), 'connectedness' appeared central to many of the positive reflections with students in the program. We felt better able to help students develop a positive self-perception and to communicate our belief in them (mindsets), better able to model strategies like strategic thinking, time management and goal setting (self-management), and better able to help students identify and address any scholarly shortcomings (academic capabilities) once they felt a sense of connectedness with us. Similarly, we felt more equipped and comfortable broaching potentially sensitive questions about the students' choice of career (professional identity) once a collaborative and productive relationship - once a 'connectedness' - was established. That is not to suggest that any one dimension is more imperative than another. Indeed, our reflections revealed that the five 'dimensions of support for learning' in Lane et al.'s (2019) framework are rarely mutually exclusive, despite the developers suggesting otherwise.

Findings revealed that the novelty of a support program designed and delivered by academics was not always an advantage. While as academics, we were able to bring high levels of scholarly and course-specific knowledge to the program, our own experiences of being high-performing students and doing study, influenced our approaches to working with students. The students in the program were 'academically vulnerable' and/or disengaged, which often meant that their experiences were different to ours. The data revealed that, at times, we found it difficult to relate to students which potentially impeded that invaluable 'connectedness' earlier discussed.

We found that, broadly, we all had similar ideas about what constitutes student success. This too appeared to be a strength of the program initially. As our reflections

progressed, however, we questioned the extent to which these views reflect a system where 'success', even that we ourselves experience, privileges certain 'middle class' characteristics that do not necessarily lend themselves to welcoming diverse groups to the tertiary experience. Charlie's belief, for example, "that all students prioritise their university studies" might align with their own experience but did not align with the realities of the many students in the program whose lives and responsibilities increasingly "spread out much further than their course and institution" (Tight, 2020, p. 697). Our involvement in this program, notwithstanding, assisted in 'holding up a mirror' to our assumptions and those of the university, which will likely inform future iterations of such programs and include a recognition of "the dual responsibilities of students and institutions in enacting inclusivity" and moving "beyond reductive standpoints" where failure is framed as individual student deficit (O'Shea et al., 2016, p. 1).

Also revealed was that despite holding similar perceptions of student success, there was evidence of some inconsistencies regarding how success of the program was understood within the team. Moreover, some of us grappled with the idea that the program's success was not necessarily contingent upon the success of every student. Rowan's reflection that "we were not encouraged to expect [...] every student" to return to a healthy academic status (i.e., successfully passing all units) highlighted a discrepancy between our understandings of 'academic capability' and 'professional identity' and that of the program. While student attrition may well be a reality at all universities across all courses (Wueffen et al., 2021), it was apparent that some of the authors felt that starting with an assumption that a portion of students withdrawing would likely be from our cohort was counterproductive. Indeed, such an assumption, we felt, had the potential to negatively affect other dimensions of support for learning. Lane et al. (2019) explain that connectedness for example, a dimension found to be so imperative here, is underpinned by the extent to which a student feels valued by others. Mindsets, too, relate in part to the beliefs that people have of others. Should academics in such a program begin with students positioned in deficit, it might be suggested that success is unlikely. Blake's reflection appears to confirm this:

> [Academic Capabilities] turned out to be the dimension in which I think I had the least impact! I feel like the students I had weren't yet at a stage where they could engage with academic skill development (R4).

Our experiences highlighted an exasperation that, in many cases, students were not receptive to recognising that they needed support, or in accepting the support offered. In discussing self-management, Lane et al. (2019) suggest it is vital that students "identify and use their own learning strategies" and "engage in behaviours that will produce a desired result" (p. 962). This undoubtedly first requires students to identify their learning weaknesses and recognise that engaging with the Academic Support Program could, in part, contribute to building these kinds of productive behaviours.

Finally, our collective narratives revealed some concerns that student success in our context required ensuing success as a beginning teacher, though we questioned whether this received sufficient consideration. Several authors described ethical dilemmas surrounding supporting students to succeed in a degree when they had fears regarding the students' capacity to later succeed in their chosen career. In referring to Lane et al.'s (2019) framework, José Sá and Serpa (2020) suggest that success in part refers to a student's capacity to internalise the competencies and knowledges required in their professional field. Questions as to the ethics of focusing upon short-term (university based) solutions without adequate regard and reflection to the long-term (professional) sustainability of the students' future career, were raised as conflicted feelings about our own duty of care to our professional body. In this way, our study raised further questions still to be answered: Is it ethical for academics in such a program to be primarily focused upon retaining students and ensuring their current academic success; and is it ethical for us to focus upon supporting the students in our immediate courses and not necessarily those they go on to teach?

Despite presenting some novel understandings to a field where the contributions and perceptions of academics to student support have been previously sparse, we recognise three limitations in this research. First, the sample was limited and consisted of just four teaching academics. While this intimate sample size foregrounds deep understanding of personal experience, it would, nonetheless, be beneficial in future to expand the study to include other programs and academics with diverse backgrounds and teaching experiences to validate or extend our findings and to potentially identify any differences experienced based upon program design, identity, context and/or stage of career. Second, participants were all from one School and one University necessitating that our findings be understood within this specific context. A more comprehensive understanding of the perspectives of academics involved in engagement and retention programs is likely if further research is conducted at other universities, in Australia and internationally. Finally, data for the research was collected during a unique 'COVID-affected' period which resulted, at times, in all students studying entirely online. It is possible that our findings regarding: the complex and diverse needs of the students in the support program; the prevalence of ''connectedness' as an important domain to student support compared to other domains; and our own sense of pressure to retain as many students as possible, were reflections of the current social and higher education environment. Studies that continue to investigate the perspectives of academics in student engagement and retention programs and their success post COVID-19 are, therefore, recommended.

Conclusion

Within the field of student engagement and retention in higher education, there is an absence of literature regarding the roles and experiences of academic staff and little evidence of support programs designed and implemented by academics. The aim of this study was to gain an understanding of how academic staff perceived student success within the context

of engagement and retention for academically vulnerable students with reference to Lane et al. (2019)'s framework. Through both written and spoken collaborative and critically reflective encounters, four academic staff explored literature-driven dimensions of student support: connectedness, mindsets, self-management, academic capabilities, and professional identity, embedded within an academic support program. Findings suggested that addressing each of these dimensions first necessitates a clear and shared understanding of what constitutes student success and how this is interpreted within a support program. Academic staff were challenged by their role in student engagement and retention and in their uncertainty surrounding their ethical responsibilities towards supporting all students. Our study also revealed that at times, academic staff were influenced by their own previous study experiences which contributed to assumptions about how students should approach and engage with study. The staff reported that, for some, the academic support program positively influenced students in developing feelings of connectedness, building self-management skills and understanding commitment, and in establishing a foundation for a student experience that fosters a pathway towards a teaching career. Not all students, however, were responsive or receptive towards staff attempts and efforts to provide support broadly. Notwithstanding, we perceived that when students were responsive, regular communication and establishing a professional student-staff relationship, the facilitation of positive engagement with study and the construction of a growth mindset, was possible.

Our understanding of student support was located in the framework developed by Lane and colleagues – intended for evaluating student support programs – and was a useful frame in assisting us to consider the varying ways in which students can be, and need to be, supported in higher education. While we did not attend to each dimension equally in our interactions with students, the framework acted as a tool for our sense-making of students' needs, and at times, validated our approaches and hunches relating to the diverse needs we encountered.

The methodological approach of critical reflection was useful here in assisting us to gain a better understanding of the program and how it worked to support students. Critical reflection among the academic team enabled a deep understanding of how staff work in the program and how work with students occurs relationally. This was further supported by the adoption of the framework developed by Lane and colleagues which facilitated our reflective process and gave structure to thinking through the different contributions a program may make to the student experience. We recognise a limitation of this study in that it does not include the views of users – the students accessing support. Further evaluation and user feedback will be important for continued learning, growth, and adaptation to the program.

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Re-orientating experiences: Considerations for student development through virtual mobility in STEM

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Abstract

Outbound mobility experiences (OMEs) provide a catalyst for learning environments that foster student development to occur in a global context. In STEM, OMEs foster critical thinking, creativity and scientific literacy. However, the sudden disruption to international travel due to the recent global pandemic has seen countries worldwide plunged into lockdown and borders closed. While the shift to online learning has been challenging, it has also provided the higher education sector an opportunity for wider implementation of online experiential learning environments, such as virtual mobility. Currently there has been little exploration of the potential of transforming physical, short-term, face-to-face mobility programs to an online environment for undergraduate science, technology, engineering and mathematics (STEM) students. This paper seeks to understand, through existing literature, how we can meet the desired program outcomes of a physical OME to support critical thinking of undergraduate natural science students, when the OME occurs online.

Introduction

Universities play a key role in equipping work-ready graduates with discipline-specific knowledge and capabilities that negotiate the opportunities and challenges brought about by globalization (Villar-Onrubia & Rajpal, 2016; Parrott & Jones, 2018). Further, the importance of developing key capabilities for new graduates has been extensively documented, from the perspective of policymakers to employers, academics, and graduates. In response to this, outbound mobility experiences (OMEs) and international study exchange programs have become a valued part of higher education globally (Bell et al., 2016). The general benefits of international learning experiences are cited as providing opportunities to students who might not otherwise be able to travel, increasing cross-cultural awareness, and supporting student development outcomes in a global context (Tran & Vu, 2018). As such, and emphasized in literature, OMEs provide students with valuable 21st century capabilities necessary for the future of work and are widely promoted by universities for their capacity to develop international career-relevant skills and personal growth (Downey et al., 2012; Adams et al., 2011). Along with this, both policymakers and scholars have become increasingly vocal on the influence of OMEs to further strengthen institutional partnership and connections, and opportunities for public diplomacy between nations (Byrne & Hall, 2013; Hong, 2021; Tran & Vu, 2018).

The reported number of university students undertaking OMEs as part of their degree (e.g. internships, placements, international study tours or short courses) has grown, driven by improved cross-institutional arrangements and increased scholarship opportunities (e.g. the New Colombo Plan, Erasmus+, and U.S. Study Abroad). In 2018, it is estimated that 5.6 million university students worldwide undertook some kind of learning experience overseas, more than twice the number of students in 2005 (Organisation for Economic Cooperation and Development, 2021).

Short-term OMEs have increased in popularity within higher education, with "fewer and fewer students are willing or in fact able to spend an entire term, semester, or year abroad" (Spencer & Tuma, 2002, p. xvi). These shorter length programs, in some countries, make up the great majority of experiences offered to university students, and are greatly an undergraduate phenomenon. For example, two-thirds of mobility experiences for Australian and U.S university students, and one-fifth of experiences for UK university students were short-term (less than a semester) in 2018–19 (Department Education, Skills and Employment, 2021; ICEF Monitor, 2020; Universities UK International, 2021).

While universities have developed many international, domestic, and virtual curriculum student mobility initiatives, periods of border restrictions have accelerated the implementation of such online initiatives. Program coordinators and institutions are being encouraged by funding bodies (e.g. Australia's Department of Foreign Affairs and Trading) to continue to design and deliver their international OME programs to fill this sudden travel gap. Virtual mobility experiences (VMEs), which have also been termed 'Collaborative Online International Learning' or 'virtual exchange', can be defined as a collaborative ICT-enabled, intercultural learning experience that can supplement (i.e. replace) or complement (i.e. pre-trip activity) a physical, face-to-face program (Vriens et al., 2016; Villar-Onrubia & Rajpal, 2016).

There has been limited exploration of physical, short-term, face-to-face OME programs, and even less for delivery in an online environment for undergraduate science, technology, engineering and mathematics (STEM) students. Engaging undergraduate STEM students generally in immersive learning experiences offers a wide range of well-researched benefits; persistence in the discipline, identity to the discipline, increased interest in STEM careers, and increased inclusivity of underrepresented groups (Sanders & Hirsh, 2014; Adkins-Jablonsky et al., 2020; Guest et al., 2006; Garibay, 2015). Learning outside of the classroom in a global context through immersion is a key component that distinguishes mobility from regular classroom-based learning. These immersive mobility experiences are one example of 'learning-by-doing', based on Kolb's experiential learning theory (Doerr, 2013). Immersion in the context of an OME is the combing of the concrete (e.g. travelling overseas) and the abstract (e.g. 'learning' from the experience) in an international location that is geographically and culturally different in context from the learners' previous experiences (Montrose, 2015). For STEM students, there is often a gap between the objects of scientific study and the lived experience, with little chance to reflect on these (Coker, 2017). An experience-based STEM OME program that includes field work, scientific research or work-based experiences "extends the classroom into the community, and students frequently encounter unfamiliar situations that challenge and contradict their perspectives" (Hatcher & Bringle, 1997, p.156). These immersive and experiential mobility experiences actively create space for learning and development in a global context.

While international experiences through physical OMEs have been shown to enhance critical thinking, creativity and scientific literacies of STEM students (Sanders & Hirsch, 2014), this paper seeks to understand, using existing literatute, how virtual mobility experiences (VMEs) in an online space can support critical thinking of undergraduate natural science students.

A review of literature

A literature review of STEM-based learing experiences in higher education was conducted in an attempt to understand critical thinking development in natural science students. This paper draws from global examples of physical (OMEs) and virtual (VMEs) experiences and programs, and the experiential learning pedagogies and tools used to support them.

STEM student learning and development

Education and research in the fields of science, technology, engineering, and mathematics (STEM) are being acknowledged around the world as core to national

development, economic competitiveness, and societal wellbeing (Freeman et al., 2019). Traditionally the purpose of a science degree has been to induct students into the discipline. However, in line with this global shift the changing nature of the practice of science poses a new challenge for educators (Rodrigues et al., 2007). STEM students and graduates are now expected to be able to think critically and analytically to interpret information from a wide range of disciplines, and to actively and ethically connect with the world around them by sharing knowledge and problem-solving resolution of social and environmental challenges (Davidson et al., 2021; Sarkar et al., 2019).

While the definition of critical thinking is highly contested among researchers, in science education it is framed around the idea that critical thinkers can solve problems and can make informed decisions based on reasoning and logic through the application of scientific principles, methods and technologies (Wilson et al., 2017). In the natural sciences, critical thinking is the ability to generate knowledge and draw conclusions about the natural world based on facts and evidence (Viterbo, 2021). It connects the learning activities of identifying, developing and critically evaluating ideas and information supported by active pedagogical approaches – specifically, in this case outbound mobility.

Using active inquiry-based pedagogies in OMEs offers the potential for significant student learning through experiential approaches (Ash & Clayton, 2009; Rayner et al., 2013). While researchers argue that for program coordinators facilitating and assessing student learning can be challenging, according to Montrose (2002), in the context of experiential learning, transforming a mobility program into a valuable learning experience for students is via the students' critical analysis of the activities and not merely the activities themselves.

Outbound mobility supporting STEM student learning and development: An unrestricted environment

Outbound mobility is a key mechanism to internationalising curriculum, supporting cultural immersion, innovating curriculum delivery, and nurturing student outcomes in higher education. With the world becoming increasingly connected, it is becoming necessary for students and graduates in all disciplines to understand other countries, cultures and people (Fox & Hundley, 2011). The term outbound mobility experience (OME) encompasses a physical overseas learning activity, whereby students "remain enrolled at their home institution while travelling abroad for a component of their home degree" (Potts, 2015, p. 4). There are a range of different physical international short-term, semester-based and yearlong OMEs available to university students across all levels of study (Table 1). As universities work to make OMEs more accessible, affordable and less complicated, more students are undertaking global learning experiences outside the traditional classroom setting (Harrison & Potts, 2016). This offers higher education institutes a space to design immersive global experiences that support student learning and development.

Table 1. Types of outbound mobility experiences available to university students across all disciplines of study, including STEM.

OME Program Types	Examples of Student Experiences
Faculty-led tours	• Thematic short-term study tours (including industry-relevant programs) • Field-based/lab immersion programs • Cultural immersion programs • Volunteering/community engagement programs • Conferences and summits (undergraduate)
Study	• Overseas short-courses or units of study • In-country language programs • Student exchange programs • Postgraduate coursework
Work-based experiences	• Internships • Practicums • Clinical placements
Research	• Research-related programs • Conferences and summits (postgraduate)

Literature demonstrates that short-term physical OMEs have the potential to construct learning environments that foster student learning and development broadly. Importantly, this environment is arguably created through a series of well-planned, structured program designs. Townsin and Walsh (2016) highlight that learning and development is not gained by traveling overseas but nurtured through a series of planned and considered educational tools and learning activities before, during and after a mobility experience. Strange and Gibson (2017) affirm this by suggesting that "international programs that are designed with experiential learning in mind to include activities that are more hands on, are likely to induce transformation that can have a life-long impact on the learner" (p. 86).

Designing a STEM mobility program that includes real-world research, projects or work-based experiences adds a meaningful layer to the students' immersive travel experience and has been shown to help students develop key capabilities, including critical thinking, creativity, problem solving, scientific literacy and scientific identity (Bamber & Pike, 2013; Murphy et al., 2019; Oliver, 2015; Sanders & Hirsch, 2014; Townsin & Walsh, 2016). Notably, McLaughlin and Johnson (2006) found learning gains in their short-term OME – including critical thinking – in the majority of participating students (60 of 62 students) as evident in the students' final assessment. In their study, students undertaking a biology program participated in a short-term OME engaging with basic hands-on environmental and conservation field research tasks, visiting several field stations and diverse natural areas. Part of the program's focus was for students to think critically about complex conservation issues. The program structure, which included pre-trip preparation, the mobility experience itself, and post-trip analysis, was purposefully designed to facilitate critical thinking and illustrate the scientific process of inquiry in action. These learning activities were supplemented

with group discussions, peer presentations, and student observation (reflective) journals to enhance student learning and development.

Utilizing experiential program design is central to cultivating learning environments for critical thinking. For STEM, and in this context of OMEs, it is the critical questioning and analysis of the learning activities designed and engaged with, situated in the real-world, that plays a key role in critical thinking development (Montrose, 2002). For example, reflection – a key part of the Kolb's experiential learning cycle – and reflective activities have been found to foster students' critical thinking. Cai and Sankarana (2015) looked at a short-term OME program to China, which included environmental science students, targeting the development of students' critical thinking skills. Through theme-based interdisciplinary curriculum, supported by cultural immersion activities and experiential program design, relying on reflection, there was evidence of enhanced critical thinking. Formative and summative evaluations of student learning captured growth in students' global awareness, critical thinking skills in analysing issues, and decision making through social and cultural perspectives applied to real-world problems. However, it was cited that critical thinking outcomes were, not surprisingly, distinctive to the individual learner, and not achieved by all students. In another OME program, Roberts et al. (2018) engaged interdisciplinary science undergraduate students including agriculture, plant science and microbiology majors in a short-term OME. The purpose of the OME was to explore the impacts of critical thinking using reflective journaling while abroad in Central America through investigation of agriculture or natural resources-related issues. Thematic analysis of the students' journal entries highlighted that students showed growth in only three of the five categories of critical thinking skills in accordance with Facione's 1990 'Critical Thinking Delphi Report'. Of concern, students lacked evaluation and explanation skills which relate to evidence of reasoning – a key part of the definition of critical thinking in science education. While including reflective activities in the design of a program provides space for STEM students to foster critical thinking, it does not always achieve such a result.

Different places and people, inherent to the design of an OME program, has also demonstrated an influence on critical thinking through global contexts. OMEs involve students travelling internationally, often to unfamiliar destinations or potentially overseas for the first time, to experience unfamiliar environments, lifestyles and cultures. OMEs allow STEM students to understand the similarities and differences between science in different cultural and geographic contexts (Guest et al., 2006).

Tran et al. (2021) found that observing different 'ways of doing science' aided the development of critical thinking in students. A group of Australian undergraduate marine science students participated in a short-term OME to Japan which included edu-tourism activities and language training. In this study, the students' experiential learning opportunities were situated within the distinctive Japanese setting, which was vastly different from the students home (Australian) context. While key objectives of the program were to build and enhance networks between the students and universities, the program also aimed to support discipline-specific outcomes. These outcomes include improved communication and teamwork, enhanced digital literacy, problem-solving skills, global citizenship, and critical thinking. Interviews with students' post-trip highlighted that the experience provided opportunities to strengthen their application of knowledge and changed their perspectives of science through real-world encounters.

While critical thinking development appears to be achievable at varying levels in a physical OME for the majority of students, the question remains if a virtual mobility experience (VME) has the potential to meet the same desired student outcome.

Virtual mobility supporting STEM student learning and development: An environment of travel restrictions

The COVID-19 global pandemic triggered an unforeseen disruption to student mobility – a threat that is not isolated. It is expected that wider global events – increasing climate change-related disasters, worsening modern conflict, and rising conscious consumerism – will continue to be disruptive on global travel (Grahame-Clark, 2020), potentially threatening OMEs. While students have experienced significant impacts, data collected by Australia Education and Career Consultants (AECC Global) found that of more than 3,000 students surveyed almost three-quarters of respondents stated they had postponed or revised their mobility plans, with only a very minor proportion (5%) saying they had completely abandoned the idea (Ross, 2021). While higher education institutions have postponed some of their mobility programs, others have accelerated the implementation of virtual mobility experiences (VMEs) to continue student mobility and improve inclusivity. The physical act of travel has also a major barrier for higher education for many dacades, with the large population of university students being non-mobile (Vriens et al., 2016). Less than 1 percent of enrolled students in the U.S participated in an international experience in 2019–2020, compared to 25 percent of Australian undergraduate students for the same period (U.S. Department of Education National Center for Education Statistics, 2020; Department Education, Skills and Employment, 2021). As such, VMEs can offer a more inclusive learning environment for the great majority of non-mobile students who would otherwise miss out on an international experience.

Student appetite for these types of online programs is also evident. Another recent Australian study revealed that 38 percent of students were open to virtual mobility experiences, a jump from 14 percent the year prior (Study Move, 2021). The study also revealed that students favoured different types of VMEs. The great majority of responding students would consider participating in a virtual internship (40%) over a virtual short course (16%) or a virtual cultural or language program (7%) (Study Move, 2021).

Leveraging and transforming existing work-based OMEs to an online environment has already demonstrated the potential to meet a range of desired student outcomes.

Currently, work-based experiences (e.g. internships) are heavily used by Engineering and Information Technology STEM disciplines (Edwards et al., 2015), and are largely already available to these students in the physical and virtual mobility space through third-party providers. Less opportunities are available to natural and physical science and mathematics students. The application of virtual research projects in place of physical activities could be considered as an additional type of learning opportunity for potential exploration and utilization for natural sciences. Fieldwork in a natural setting for this discipline has been shown to enhance critical thinking, as well as problem-solving capabilities and self-confidence of natural science students (Lei, 2010). It has been demonstrated that the design of an OMEs in the natural sciences typically rely on real-world, experiential learning activities. Enacting this in a virtual space can be supported by online experiential learning approaches. This allows students to gain knowledge and capabilities through meaningful virtual experiences based on real-world examples, while exploring and reflecting through online sharing and collaboration (Vriens et al., 2016).

Studies have highlighted that VMEs can also achieve learning and development for STEM students generally. As highlighted by Villar-Onrubia and Rajpal (2016), STEM-based virtual learning activities intertwined with intercultural collaboration and dialogue, which lend themselves to both OMEs and VMEs, have been shown to create a space for professional practice. In a collaborative virtual project between two universities, UK students worked online with students in China to improve the design of an existing highway junction. While students gained practical experience, producing a project report and presentation delivered to industry professionals, the aim of the program was designed to develop the students' understanding of cultural diversity in team-based engineering professional practice (Villar-Onrubia & Rajpal, 2016). This desired outcome was reportedly achieved.

There is, however, little available literature that demonstrates the application of VMEs for undergraduate natural science students, and even less on these experiences' potential to develop critical thinking capabilities. Other applied disciplines have found evidence to support critical thinking development through VMEs program design. Notably, a U.S university adopted a VMEs as a pre-trip activity for a physical program. The program aimed to develop students' global capabilities, observing critical thinking as a result. Sports-science students engaged in an 8-month online program before a short-term physical trip to Thailand focused on social change through adaptive sport. Reflections captured through assessment tasks found evidence of critical thinking. Duffy et al. (2020) found that critical thinking was "derived from the "process" [being immersed] not the "products" (i.e., the assessments)" (p. 10). The interwoven dynamics of the desired global capabilities (cross-cultural communication, and a sense of global awareness and mindfulness) provided a catalyse for critical thinking. It is thought that the intercultural interactions facilitated online have potential for developing critical thinking skills as students made comments about "recognising different power dynamics, debunking assumptions, and the trial-and-error process of figuring out how to communicate more effectively" with their Thai counterparts (Duffy et al., 2020, p. 10). The design of the program allowed for reflection which aided and fostered critical thinking.

For some academics in STEM a fully virtual approach "does not necessitate the loss of experiential learning in the field" (Lashley & McCleery, 2020, p. 12617). As such, natural sciences, and other applied disciplines, are adopting a blended model. In some instances, the physical aspects occur locally through short-term domestic experiences away from campus. For example, Lashley and McCleery (2020) presented a blended concept for field-based experiences in a whole-of-unit approach for ecology and evolutionary biology curriculum. The authors redesigned two courses that involve a "flipped classroom pedagogical approach that has a synchronous, asynchronous, and intensive laboratory experience sections of the course" (p. 12615) as a COVID-19 response. They found this blended delivery, whereby content was delivered online coupled with intensive localised field activities, created an effective model that retained the benefits of learning in the field for natural science students and supported student development. However, the specific capabilities developed were not defined.

Other researchers have focused on discussing online tools that can be used to foster critical thinking in a virtual space. For example, McLaughlin and Munsell (2015) indicates the use of multimedia in their online modules, namely 'CHANCE', provided high school and undergraduate science students with a "representation of cutting-edge scientific research" (p. 5). These online tools – animations, videos and virtual experiences – allow for engagement through inquiry and give space for students to "explore, critically think about, and understand key environmental science issues and biological concepts." (McLaughlin & Munsell, 2015, p. 5). Using real science data and information, project outcomes suggest that the module allowed students to develop their critical thinking capabilities by exploring, observing, questioning, hypothesizing and analysing. In another study, Thompson et al. (2003) developed a VME program using interactive online scenarios and role play for advertising students. The design of the program aimed to improve students' critical thinking and problem-solving capabilities observing real-world issues. The students took on a virtual role (character) during the interactions. To support this, they interviewed various experts to gain a deeper understanding of the issues, sharing their perspective with the online class. While the outcomes of their project were not provided, they confidently anticipated that the program design would foster critical thinking – "students will exhibit higher-level critical thinking skills and more creative resolutions to various problems after participating in the 'virtual exchange' [VME]" (Thompson et al., 2003, p. 189).

Conclusion and next steps

If we consider the growing need to respond to the impacts of our world's increasing social and environmental challenges and STEM's role in this, critical thinking capabilities are strongly required by science students and graduates. Mobility experiences have been shown to have the potential to develop key 21st century student capabilities, including

critical thinking, in both physical (OME) and virtual (VME) settings. While there is a critique around the measuring and assessing of student learning, generally studies have highlighted that the development of students' critical thinking is more than likely achieved through reflection and at times as an unexpected by-product of other structured activities and interactions. It is also evident that the design of the experience, whether it is physical or virtual, plays a role in the development of capabilities and utilizing experiential learning design is core to this. Engaging undergraduate STEM students generally in immersive learning experiences offers a wide range of well researched benefits. These benefits include critical thinking.

To date there has been little exploration of the potential of transforming (or reorienting) physical, short-term, face-to-face OME programs for delivery in an online environment (i.e. a VME) for undergraduate natural science students. Fieldwork in a natural setting for the natural science discipline has been shown to enhance critical thinking, as well as problem-solving capabilities and self-confidence of natural science students – which has been drawn upon in OME litertature. Drawing on existing VME literature from various other applied fields shows that engaging students using real–world material – whether that is scientific data, virtual scenarios or online discussion, with supplementary e-learning materials – has also been shown to have potential to foster critical thinking in students. This could also have applications in natural science. Repeatedly it has been shown that reflection and dialogue aid this process and needs to be included as a core part of the program design where the intention is to foster critical thinking.

While VMEs do not replace the true contextual experience, and often discomfort, of travelling overseas (e.g. sights, smells, sounds, food, unplanned interactions or incidents) that can be transformative for students, they do provide a potential option to enrich student learning and development from home in the current and potential future travel impacts we are experiencing. Further, VME programs offer a more inclusive learning environment for the great majority of non-mobile students who would miss out on an international experience otherwise. The ideas presented in this paper will be further explored. That being, STEM student learning and development through an online experiential VME for undergraduate natural science students, and further to provide access opportunities for non-mobile students and offer immersive learning experiences in circumstances where international travel is restricted once again.

Ethical statement

This study has been approved by the Human Research Ethics Committee (HREC) at Western Sydney University. The ethics reference number is: H14388. This HREC constituted and operates in accordance with the National Statement on Ethical Conduct in Human Research 2007 (Updated 2018).

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Online student response systems and student engagement in large EFL classrooms

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Abstract

This study investigated how the use of online student response systems (OSRS) in conjunction with an active question and answer technique affected student engagement and achievement in on-ground classes. Quantitative and qualitative data from 118 undergraduate nursing students, related to the change from classical to online question-answer (QA) activities, were collected using pre-tests, posttests, questionnaires and interviews. Two systems (Zuvio and Socrative) were introduced, allowing all students in large classroom environments to share their answers with personal smartphones before teacher feedback was given. The findings indicate that the question-answer activity using OSRS improves and retains student engagement in large classes. Two factors that contribute to the high engagement include anonymity and personalized feedback.

Introduction

Getting all students to engage with what they are studying is a top priority of many teachers. Students who engage in learning activities tend to practice and study more, enjoy it more, and be able to understand more of their course content than students who passively receive what we teach. Research has demonstrated that active learning strategies help increase student engagement and improve their academic performance (Mohrweis & Shinham, 2015; Nelson & Crow, 2014). Instead of just getting students to listen and take notes, active learning is "any instructional method that engages students in the learning process" (Prince, 2004, p. 223). Of all active learning activities, question and answer (QA) gives teachers a chance to immediately assess whether individual students understand a particular concept that has been covered in class. In a classical QA activity, the teacher makes pauses during his or her lecture, asks a few questions on what was just covered, and randomly calls students to answer the questions. QA is similar to Elicitation. Both techniques are used by teachers to obtain information about what their students do or do not know. However, the former uses questions while the latter involves using pictures, actions, and descriptions.

In the classroom, English teachers often ask questions to check students' understanding of course content. These teachers are presented with a huge challenge, which is that having each student in large classes answer questions takes up too much class time. Because of this, teachers often only call a small number of the students. However, there are two problems involved with only asking a few students. First, it does not allow for the teacher to hear the responses of all individual students in class and to check how many students actually understand what is being taught. Second, if only a few students are required to participate in the lecture, it can be more difficult to keep other students engaged when they are not given the opportunity to share their ideas with the class (Chen et al., 2016).

Our solution to these problems is to find a technological component that would allow all the students to share their ideas with the class. Socrative, Poll Everywhere, and Plickers are examples of online student response systems (OSRS) – a web-based technology that runs on any device with a web browser and internet access, quickly gathers student feedback, and tells us whether each student understands what is being taught. Research has proved that OSRSs can facilitate active learning pedagogical approaches and increase student engagement. Mork (2014) surveyed 214 students using Socrative in their EFL classes at two Japanese universities. She found more than 95% of her students enjoyed using the system to respond teacher-led comprehension checks. Beside enjoyment, her study claims that using OSRS motivates students to learn and allows students to get rapid feedback on their knowledge and performance from all their peers and the teacher. In the second study, Chen et al. (2016) conducted a ten-week study with 231 Japanese university students who were learning English grammar in their school. Chen divided those students into experimental (n = 124) and control groups (n = 107). The students were tested using weekly tests to measure the accuracy by which students applied the English grammar rules they were taught, and surveyed for their perceptions of the benefits that Poll Everywhere (PollEv) could add to an active learning Think-Pair-Share (TPS) activity. In the whole group comparison, the experiment group using PollEv performed better on grammar test scores as compared to the control group that did not use it. The percentage of students who enjoyed TPS in the experiment group (77.42%) was also greater than that of the control group (65.93%).

Having appeared on campus only half a decade ago, OSRS has become a ubiquitous presence in language classrooms because teachers who use it seem to have engaged students in the learning process and improved their learning outcomes. With the many options, we considered the question variety, training and support when adopting Socrative and Zuvio for our research. First, they allowed teachers to make use of various question types. This includes short answer questions that are applicable across a wide range of courses in languages and other disciplines. Second, the lead researcher for our project has nearly two years' practical experience of implementing the two apps into the classroom. He could train our faculty and staff to train others and teach us to troubleshoot the common problems on our own. Finally, both apps were freely available at the time of writing. They provided a full user guide, numerous video tutorials, an excellent FAQ, and a community support forum.

While there is a growing body of scholarly work on the relationship between online student response systems (OSRS) and student engagement/learning outcomes, we noticed the impact of OSRS on the effectiveness of active learning strategies, engagement levels, and achievements of students in large classes had not yet been fully explored. In order to fill that gap in the literature, we conducted an investigation combing quantitative (tests, surveys) and qualitative (interviews) methods that helps us to better understand the relationships of using two different OSRS with the experiences and performances of university students using such tools in EFL settings. To enable teachers to gather quick feedback from all students in the classroom, we selected two technologies: Socrative (www.socrative.com) and Zuvio (www.zuvio.com.tw). The study was guided by the following research questions:

RQ1. Can the use of online student response systems (OSRS), combined with the Q&A technique, affect student reading and vocabulary test scores in large classes?

RQ2. Does the use of OSRS enhance student engagement?

RQ3. What is the impact of using OSRS on students' perceptions and attitudes towards learning English language in large classroom environments?

Literature

Language learning strategies

Learning strategies are actions taken by students to improve their own learning (Oxford, 1990). Learning strategies, according to their functions, can be divided into six groups. Cognitive strategies such as analyzing and classifying is

the first type of learning strategies that help students to understand and recall new information. Metacognitive strategies are used to plan and to evaluate students' own progress towards communicative competence. There are also affective strategies, which develop self-confidence and dedication for more active involvement in the learning process. Social strategies stimulate interaction of students with others, while memory strategies support students and help them store, retain and later retrieve information. The last type is compensation strategies. These strategies such as guessing or using gestures provide emphasis and meaning to fill the knowledge gaps of students (Oxford, 1990). In foreign language education, learning strategies are important as they help students to be more involved and self-directed. If students can get more control of their learning process, they will have a higher chance of success in developing communicative competence. Hence, teachers play a critical role in helping students to apply these strategies. Online student response systems (OSRS) can help teach metacognition that develops students' ability to reflect what they learn through questions, think of ways to improve, and try again and go back to reflection.

From constructivism to active learning

In contrast with a model of instruction whereby knowledge is transmitted from teachers to students, active learning means students are active in the learning process as they take more responsibility for their own learning. Active learning is based on a theory called constructivism. This theory views learning as an active process in which learners gain a deeper understanding of a subject through their own action and reflection (Cattaneo, 2017; Freire, 1993; Jonassen, 1991). In schools that use constructivist teaching methods, students learn new knowledge and skills for themselves by doing and reflecting on their academic progress rather than by passively absorbing information from teachers. Students are asked to bring prior knowledge as the basis for the construction of new knowledge into a learning situation. Also, students are encouraged to work with and give feedback to their peers, think critically, and reflect on what they have done and how their understanding has changed.

Within the active learning framework proposed by Edwards (2015), long-lasting learning outcomes "come through direct experience and interaction with the intellectual, social, and physical environments" (p. 26). In an intellectually active learning classroom, students engage with the content using higher, more active levels of cognitive thinking in Bloom's Taxonomy such as applying, analyzing, evaluating, or creating. Examples of instructional strategies include concept maps and synthesizing research for presentations. Equally important as intellectual involvement is being social active. When students feel connected to their teachers and peers, they put more focus on "learning the material and building academic skills" (Furrer et al., 2014, p. 5). Small group and whole class discussions are two methods for having students involved socially as they learn content in the classroom. Classrooms can also be arranged to accommodate the needs of the physical activities that require students to move during lessons. Several strategies such as board games and creating videos assist students to release energy and at the same time, to stay focused.

Research attributes the following benefits to active learning (Bonwell & Eison, 1991; Lee & Hines, 2012): an increase in student engagement and understanding. Active learning gives students greater involvement and control over their learning than traditional (passive) lectures, which in turn creates their interest with the content of a subject and keeps them motivated. In addition, active learning requires students to construct new understanding by interacting with teachers, peers, and artifacts. For example, teachers make pauses during their lectures or presentations, ask questions (or have students ask each other questions) to check understanding, and provide more frequent and immediate feedback to students.

Potential challenges of active learning are not difficult to imagine (Bonwell & Eison, 1991; Ungar et al., 2018). First, teachers may notice they need to cover more content in less time when they implement active learning in their classroom. Preparation is also a common struggle for many teachers who already have an excessive workload. They do not have enough time for preparing active learning activities. In large classes, teachers also tend not to use active learning because they think they would not have enough time to monitor all students' learning progress. Bonwell and Eison (1991) argued that although active learning decreases lecture time, there are other ways to ensure that students learn assigned course content such as using reading and writing assignments. Second, preparing for active learning activities does not take more time than preparing for new lectures. In a class larger than 40 students, teachers can use a variety of methods to involve all students in plenary activities. For example, the class can be divided into small groups for discussions. Finally, good teaching may not result in good learning. There is often a gap between what teachers have taught and what students have actually learned, and that disconnect happens more than many teachers realize. To mediate the disconnect, a pedagogical approach proposed by Duckworth (2006) suggests to teachers that they should learn about their students and how to help students learn effectively either individually or as a whole group. An application of this approach is teachers listen for common themes and questions among their students. Based on a firm understanding of the students' needs, teachers provide advice or a new framework that guides the students to improve their understanding and outcomes.

A more recent literature found that another frequently mentioned barrier to teachers' use of active learning techniques was lack of technological knowledge and experience (Ungar et al., 2018). As technology advances, it changes how students learn in school. Many teachers are expected to design more active, learner-centered tasks using technology. However, they do not know how to choose the right tool or how to operate it for the tasks they have prepared in their lessons. Some teachers also worry technological failure would interrupt the lesson flow if it takes considerable time to repair. Additionally, the technology-related insecurity limits teachers' use of active learning. When teachers become aware of the fact that their students have more technological knowledge and experience than themselves, often they start to feel insecure, and then

avoid using technology to make the learning environment more active. A carefully-designed implementation process is perhaps most needed to overcome such barriers (Kelly, 2015). In the process of designing the implementation, school administrators must collaborate closely with teachers. The ways of engaging teachers include full discussion with teachers on the needs and goals of using technology such as supporting the active learning. Also, school administrators should identify teachers with experience successfully using technology in their curriculum and invite them to work as coaches because they can "describe their own successes and obstacles" and positively influence other teachers (Kelly, 2015, p. 42).

Classroom spaces

Over the past two decades, classroom space has received a great deal of attention from researchers because changing a traditional classroom into a new setting that accommodates active learning pedagogies can enhance the learning outcomes (Hyun et al., 2017; Phillipson et al., 2018). In the Student-Centered Active Learning Environment for Upside-down Pedagogies (SCALE-UP) project, North Carolina State University (NCSU) created classrooms where student teams sit at a round table and have whiteboards nearby. This round table approach works to foster collaboration and to encourage sharing. Comparing data (classroom videos/audio recordings, interviews/focus groups, pretests/posttests, portfolios of students work) of nearly 16,000 traditional and SCALE-UP students taking physics, NCSU's researchers found that students in the redesigned classroom not only have better abilities to solve problems and to understand physics concepts, but also better attitudes than traditional students (Beichner et al., 1999).

There are a few scholars who are interested in preparing teachers to teach in these spaces. Forman (2014), for example, describes the professional development workshops provided by the University of Iowa in which all active learning classroom instructors learned active learning pedagogies. Examples include inquiry-guided learning, peer instruction, and team-based learning. Another focus of interest is instructors' experiences during their time in active learning classrooms. Phillipson et al. (2018) interviewed seven novice teachers about their experience in an active learning classroom (ALC) project at Queen's University in Canada. The study indicated that all the teachers perceived that teaching in the ALC was "a unique experience that shifted their behaviours and perceptions—both about student learning and about their own roles in the classroom" (p. 13). Transforming into teacher-learners, these teachers felt excited about being in such a classroom just like their students, and expressed intention to employ active learning approaches in the future. Being able to help students to become independent thinkers by giving them space for enquiry and by putting them in charge of learning made all the teachers enthusiastic about ALC. Unfortunately, it was not financially practical to change all the classrooms on campus to ALC. This situation has not prevented researchers seeking to promote active learning but inspired them to investigate whether utilizing active learning activities in classroom that were set up to accommodate traditional lecture style teaching could bring positive changes in students' engagement in the classroom.

Students' perceptions on large classroom learning

Many schools only offer large English language classes (may consist of 50 or more students) if they do not have enough budget, space, or faculty. This may increase levels of anxiety among some university students because if classes are too big they cannot adequately learn the material and get help when needed, while others are more comfortable being anonymous in a crowded classroom. Koenig et al. (2015) conducted a survey of 75 college students for their assumptions about large classes. It was found that the most common reasons why students preferred large classes were related to class content (courses not needing individual instruction, 31.6%), decreased responsibility (skipping class more often, 28.8%), and student number (e.g. having more students in class, 25.4%).

However, some problems are created by overcrowded classrooms. Less individualized focus is perhaps the biggest challenge that is nearly impossible to find a solution to overcome. When there are too many students, teachers cannot spend the same amount of time with each student and give additional attention to students who struggle to make progress. Additionally, Elson et al. (2018) examined the responses of 266 students in an accounting course to questions inquiring about in-class experiences, and identified instructor-student interaction as a key factor that influences student perceptions of course effectiveness in large classes. Students who had more interaction with the instructor expressed satisfaction with the course, compared to students who had less interaction.

Correlation between the use of OSRS and student engagement

Research has shown that student response systems improve student engagement and performance by creating an active learning on-ground classroom (Abir, 2017; Dong et al., 2017; Dunn et al., 2013; Miles & Soares da Costa, 2016). This contention is supported by Stevens et al. (2017), who found 82% of their 161 third year medical students who enrolled in a clinical microbiology course at a college in Ireland agreed that the teaching sessions where the clickers were used were more engaging than the sessions without the clickers. In another study, Terrion and Aceti (2012) explored the reactions of 200 students (177 freshmen, 16 sophomores, 4 juniors, 3 seniors) in a large introductory chemistry class at the University of Ottawa in Canada to eInstruction's Classroom Performance System (http://www.einstruction.com/) with a five-point Likert-type scale. The findings indicate that there was a positive correlation between clicker implementation and student engagement ($r = .0678$, $p < 0.01$), and students believe that using clickers as part of the class lecture help them to more effectively learn the course material ($r = 0.577$, $p < 0.01$).

Online student response systems (OSRS) can work with a multitude of devices and operating systems without buying expensive hardware. OSRSs offer various types of questions that teachers can give to students. Also, they deliver the questions directly to students' personal Wi-Fi-enabled devices such as their smartphones or tablets (Chen et al., 2016; Shea, 2016). There are many useful and free OSRSs available for teachers to creatively engage students using their personal smartphones. Balta and Awedh (2017) successfully promoted collaboration among 112 students at a university in Turkey through Socrative. Teachers first logged in and shared four to six physics questions that they prepared in advance on Socrative. Students then logged in, worked in pairs or small groups for 15 minutes, and submitted responses on their own devices.

Not all the studies involving the use of SRS/OSRSs in the classroom have shown an improvement in student engagement. For example, Zapf and Garcia (2011) compared the perceptions of engagement and class grade point average (GPA) from 405 students at a regional Midwestern university in the United States. Their findings indicated that a clicker class enrollment failed to change student perceptions of level of engagement in classroom activities. However, Zapf and Garcia did not provide the amount of time that they gave to the students for submitting their responses. Such methodological nuances among all the investigations may explain why we found the capricious results.

Method

Subjects

The study took place at an urban private university in Taiwan. The researchers of the study worked as English teachers at this private school. 118 students who participated in the study were first-year undergraduate students enrolled in a two-year nursing program. The students were, as participants, predominantly female. Their ages ranged between 20 and 22 years. They took their integrated English skills course in the fall semester of the school year 2019. Most students have been trained to use metacognitive strategies such as using syllabus as a roadmap for learning English. The study lasted for six weeks. Each week, students were required to spend two hours in the classroom, with 12 total hours of in-class instruction. The course focused on developing students' reading comprehension and vocabulary skills. The course instructors taught the course using Zuvio and Socrative in conjunction with an active question and answer technique. All the classrooms at the university are already equipped with projectors, Wi-Fi technology, and support for using computers. The applications are integrated with our PowerPoint and Keynote software. Teachers open the PowerPoint/Keynote software in conjunction with free versions of Socrative and Zuvio, and engage students with the questions made for the lesson they are teaching.

There were six reading passages assigned in advance of every class meeting. Each passage contains 600-800 words and focuses on one single issue. Students who registered for the courses were approached by the course instructors to discuss the research agenda. The instructor informed the students that the courses would be facilitated using Socrative or Zuvio. The instructors provided the explanations of both systems. Then, the students were asked for their consent with a choice to opt out of the study. Their course grades were not affected by their decision in any way. Finally, the students were guaranteed that their names and academic records would not going to be included in the study.

Research design and instrumentation

A convergent parallel mixed methods design was used to discover if the use of Socrative or Zuvio increases the value of the questioning activity, and if the two services affect student achievement and their perceptions towards learning English. In this design, the researchers collected qualitative and quantitative date concurrently, analyzed them separately, and then merged both data sets. The reason for collecting both quantitative and qualitative data is to have multiple perspectives on the impact of online student response technology both with students' own devices and without. For answering the 1st research question (Can the use of online student response systems, combined with active calling technique, affect student reading and vocabulary test scores in large classes?), test scores were used to test the hypothesis predicting that the uses of online student response service would positively influence the reading comprehension skill for the first year students in the two-year program. Also, the survey results were used to understand how these students respond to the classical QA activity and its two technology-enhanced variations, which would help the research team to answer the second and third research questions (Does the use of Socrative or Zuvio enhance student engagement? What is the impact of using Socrative or Zuvio on students' perceptions and attitudes towards learning English language in large classroom environments?).

To seek information that might not had been found in the survey, the researchers conducted individual interviews with a total of 12 students who were randomly selected from two OSRS groups using a random number generator (six students from each group) for more input on the QA activity. On the scheduled dates, the researchers met with the selected students at the office and followed a designed interview protocol, consisting of seven open-ended questions (see Appendix B). The interviews lasted from 30 to 60 minutes. They were audio recorded, carefully transcribed and analyzed. The researchers employed thematic content analysis to find common patterns across the interview data. The four steps that the researchers follow are: 1) reading through the transcript interview responses several times; 2) coding the whole text; 3) searching for themes or patterns within the data; 4) creating a narrative that includes quotes from the teachers.

Being randomly assigned, one class (G2, n = 32) used Socrative, the other classes used Zuvio (G3, n = 45), and still another class did not use either of the two services (G1, n = 41). It was expected that a cause-effect relationship exists between the use of OSRSs and the accuracy by which students used their reading and vocabulary skills they were taught in the course as measured by their performance on

pretest and posttest written by the researchers. The two tests were used as a summative assessment tool to assess English ability of newly admitted students, to ascertain the students' acquisition of the reading and vocabulary skills that they learn in the class, and to detect any change that OSRS brings. Both tests are identical with 25 multiple choice questions, worth four point per question. One administrative assistant scored all tests using an answer card reader and an answer key. The researchers of the study, who taught English reading more than 10 years, were responsible to design the pretest, posttest, and answer key. After revisiting the overall objectives for the courses and determining which goals we intended to evaluate with the tests, we created an objective test with 50 multiple-choice questions to measure students' performance in reading comprehension and vocabulary knowledge. The test items were then assessed on the basis of three key criteria: representative, ambiguity and clarity (Angleitner et al., 1986; Delgado-Rico et al., 2012). The same tests were administered to the same small group of three students who enrolled in the night nursing program twice at different time points. The test-retest correlation between the two sets of their scores was at 0.85, indicating a good reliability.

Before starting to integrate Socrative or Zuvio into lectures, the teacher held a 20-minute introductory session with a PowerPoint or Keynote presentation in a computer lab, and made sure all students had a smartphone and access to internet. The students were then asked to (a) visit Socrative (www.socrative.com) or Zuvio (www.zuvio.com.tw) homepage and sign up with their English first name, last name, email and password, (b) look for a confirmation email and click the link in that email to verify their email address, (c) download the Socrative or Zuvio application to their iOS or Android smartphone, (d) log in with their registered email and password, (e) enter a code provided by the teacher so they can join the Socrative or Zuvio presentation, and (f) respond to questions. The teacher supported the students while they worked through the steps.

Data collection procedure

The class met once a week for 120 minutes for the course lecture and activities. The on-ground classroom teachers implemented two five-minute teacher-led sessions that incorporated a Q&A active learning activity each session (Q&A format was the only one used so the relationship might be able to be established to demonstrate it has an effect without another factor that can explain the relationship as well)—one in the middle and the other in the end of the lecture to help students practice reading skills, as well as communicate the facts and ideas of the reading passage assigned for that week. During the session, the teacher summarized what has been taught within the first minute and asks one multiple choice question. Students will have 60-90 seconds to think and formulate a response. The teachers will use the last 2 minutes to give feedback for correct and incorrect responses. All of the groups in the study participate in these activities. The teachers use the same teaching materials and measurement instruments. The only difference between the control group (G1), Socrative group (G2), and Zuvio group (G3) is the method that the teacher used to gather student answers. In the control class, the teacher called on students to share their answers with the class aurally. In the OSRS classes, the teacher used Socrative/Zuvio to collect all of the students' responses anonymously.

The students in the Socrative and Zuvio groups answered the same questions as those given to the control group as well. They had 60-90 seconds to solve problems before casting their votes. The result of the voting for two OSRSs groups appeared on the teacher's computer and was projected on the screen. The teacher opened a whole class discussion where the students defended their choices. Finally, the teacher highlighted the correct option and explained why it was the correct one and why others were not. Figure 1 shows an illustration of the three variants of the QA session, adapted from the SRS flowchart by Arnesen et al. (2013).

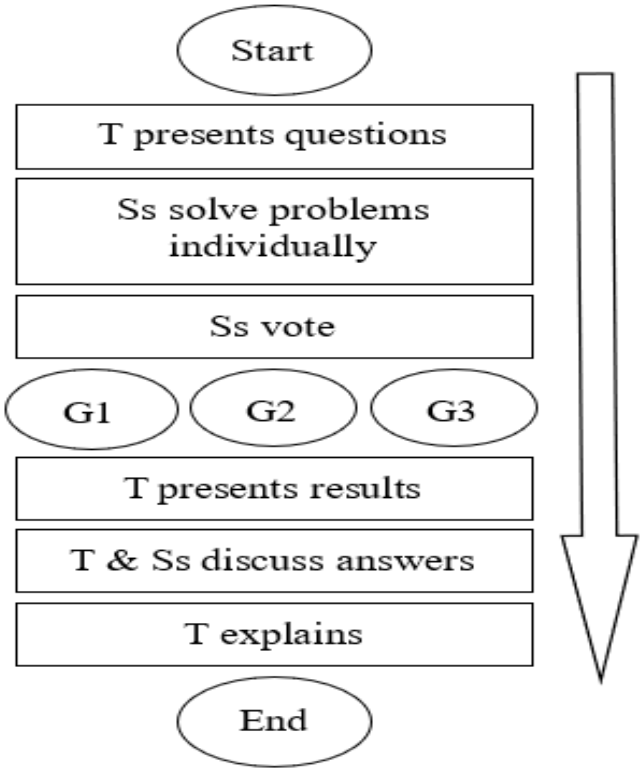

Figure 1. Illustration of the OSRS session.
Note. T=Teacher; Ss=Students.

Because our students were randomly placed into the course based on their total entrance exam scores instead of their English subscores, it was first necessary to measure English proficiency of the three groups to better understand the effects of the interventions. For this reason, OSRS was not implemented in the class until the fourth week of the course. The pretest was administered by two trained student research assistants to all 118 students in the third week of the semester, and the posttest in the 10th week. A modified version of the Student Response to Instructional Practices Survey (see Appendix A, written permission is obtained to use the survey), using a five-point Lik-ert scale was administered twice, first in the third week and again in the 10th week to determine if there is any change in students

engagement after using the OSRS (DeMonburn et al., 2017).

One-way Analysis of Variance (ANOVA) was used to compare the means of the three groups and see which approach creates a highest level of student engagement and academic performance in large classes. The independent variable (IV) in the study is the type of Question & Answer activity, whereas the two dependent variables (DV) are student responses to instruction and test scores.

The null hypothesis for the one-way ANOVA is that there is no significant difference among the groups. After cleaning the data, the researchers tested the assumptions of ANOVA by calculating the F-ratio and the associated probability value (p-value). If the p-value associated with the F is smaller than .05 then the null hypothesis is rejected. If the null hypothesis is rejected, we conclude that the means of all the groups are not equal, and we run post-hoc tests (t tests) to examine where the group differences lay.

Results

RQ1. Can the use of Socrative or Zuvio, combined with an active calling technique, affect stu-dent reading and vocabulary test scores in large classes?

The pretest and the posttest scores were first compared using an ANOVA test (see Table 1). The results suggest that no obvious difference ($p = 0.38$ for pretest; $p = 0.11$ for posttest) was observed in each test among the three groups (G1, G2, G3). We proceeded with the Tukey post hoc test to see between-group difference, but found no significant difference in pairwise comparisons. How-ever, in the Socrative treatment condition (G2), a significant change was found from pretest to posttest ($p = 0.0137$).

Table 1. Pretest and posttest scores.

Group	n	Pretest		Posttest	
		M	*SD*	*M*	*SD*
G1	41	52.20	12.36	49.85	15.60
G2	32	47.88	12.99	56.38*	13.80
G3	45	50.93	14.15	50.22	13.82
G1 vs G2 vs G3		$p = 0.38$		$p = 0.11$	
G1 vs G2		$p = 0.35$		$p = 0.14$	
G1 vs G3		$p = 0.89$		$p = 0.90$	
G2 vs G3		$p = 0.57$		$p = 0.16$	

*Note: * = The pretest-posttest change is significant with a p-value of 0.0137.*

RQ2. Does the use of Socrative or Zuvio enhance student engagement?

In response to the first statement (see Table 2), more than 65% of students in each OSRS group (G2, G3) reported they almost never or seldom disengaged themselves from the question and an-swer activity, compared to the classical group (G1) with only 27%. 72% of G2 students participated actively, while less students were found in the other two groups (G1-55%; G3-46%). When asked whether or not they pretended to participate (levels of student engagement), 61% of the G2 student respondents indicated that they almost never pretended while less than half of the students in G1 (47%) and G3 (46%) did. Approximately half of the students in all groups agreed that the required effort/ responsibility helped them to learn the material.

Table 2. Student response to instruction.

#	Statement	G	M	Almost Never	Seldom	Some -times	Often	Very Often
1	I did not participate in the activity.	G1	2.29	26.53%	30.61%	32.65%	8.16%	2.04%
		G2	1.75	47.22%	36.11%	11.11%	5.56%	0%
		G3	2.05	40.00%	25.71%	25.71%	5.71%	2.86%
2	I distracted peers during the activity.	G1	1.69	51.02%	34.69%	10.20%	2.04%	2.04%
		G2	1.69	44.44%	41.67%	13.89%	0%	0%
		G3	2.00	34.29%	42.86%	14.29%	5.71%	2.86%
3	I pretended to participate in the activity.	G1	1.88	46.94%	30.61%	14.29%	4.08%	4.08%
		G2	1.56	61.11%	22.22%	16.67%	0%	0%
		G3	2.26	45.71%	20.00%	8.57%	14.29%	11.43%
4	The efforts I made helped me learn English.	G1	3.84	0%	2.04%	24.49%	40.82%	28.57%
		G2	3.81	2.78%	2.78%	33.33%	33.33%	27.78%
		G3	3.57	14.29%	8.57%	20.00%	20.00%	37.14%
5	I participated actively (or attempted to).	G1	3.65	0%	8.16%	36.73%	36.73%	18.37%
		G2	3.86	2.78%	8.33%	16.67%	44.44%	27.78%
		G3	3.29	11.43%	17.14%	25.71%	22.86%	22.86%
6	I saw the value in the activity.	G1	3.69	0%	6.12%	38.78%	34.69%	20.41%
		G2	3.36	5.56%	2.78%	47.22%	38.89%	5.56%
		G3	3.40	11.43%	17.14%	17.14%	28.57%	25.71%
7	The time used for the activity was beneficial.	G1	3.78	0%	4.09%	32.65%	44.90%	18.37%
		G2	3.44	5.56%	2.78%	27.78%	55.56%	5.56%
		G3	3.43	14.29%	11.43%	20.00%	25.71%	28.57%
8	I enjoyed the activity.	G1	3.57	0%	8.16%	38.78%	40.82%	12.24%
		G2	3.42	8.33%	11.11%	25.00%	41.67%	13.89%
		G3	3.17	14.29%	14.29%	31.43%	20.00%	20.00%

Notes: G = group; M = mean; T = teacher; t = time

Further, the statements or variables were classified into two major factors—participation/engaging and perceived value of activity—by using exploratory factor analysis (see Figure 2).

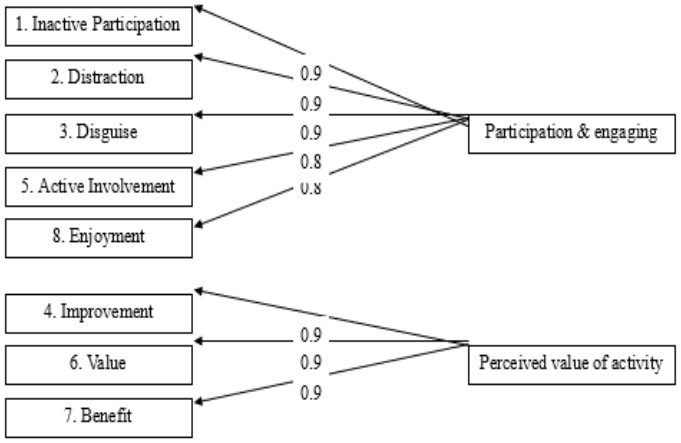

Figure 2. Factor analysis.

RQ3. What is the impact of using Socrative or Zuvio on students' perceptions and attitudes to-wards learning English language in large classroom environments?

Individual interviews were conducted with the 12 randomly-selected students (see Table 3) to elu-cidate the impact of the apps on their experiences in large classes. There were seven questions that students answered at the interviews (see Appendix B).

Table 3. Profile of interviewed students.

Interviewee	Group	Gender	Reading Comprehension Scores		
			pretest	posttest	change
1	Socrative	F	36	48	12*
2	Socrative	F	52	68	16*
3	Socrative	F	52	80	28*
4	Socrative	F	76	68	-8*
5	Socrative	F	52	68	16*
6	Socrative	F	40	76	36*
7	Zuvio	F	56	64	8
8	Zuvio	F	68	64	-4
9	Zuvio	F	60	60	0
10	Zuvio	F	72	72	0
11	Zuvio	F	40	40	0
12	Zuvio	F	76	52	-24

*Note: * = The p value is less than 0.05*

Table 4. Themes and quotations.

Themes	Student Quotations
1. Accessibility	"easy to use" "see questions clearly on my phone"
2. Assessment	"teachers instantly gather students' feedback and give comments"
3. Management	"get all students involved in the activity"
4. Competition	"make students compete against each other"
5. Challenge	"the app crashed" "not know the completion rate of the quiz"

By examining the interview transcripts of twelve participants, the researchers identified five themes (see Table 4) to progress further: accessibility, assessment, management, competition and challenge. The following direct quotations were originally written in Chinese and translated into English by the authors.

The two apps allowed every student an easy way to contribute their opinions through the use of their own mobile phone or tablet. One student said "I grab my smartphone and complete the quiz;" another student said "I can see the questions clearly on my phone and answer them quickly." Two students told the interviewers they liked the apps because the designs made it easy for them to an-swer questions. The apps had one question per page instead of multiple questions on a page. Stu-dents saw the question within a single viewable area of the screen and selected `submit answers` to go to the next page. One student suggested incorporating competition into the activity to make it more engaging. She said "To encourage participation, the Q&A activity can be redesigned to make students compete against each other by earning points based on answering questions correct-ly in the least amount of time."

The OSRS supported teachers to control and monitor their classrooms. Teachers live polled stu-dents to see how well they understand the material, and controlled when feedback was sent to their screens, immediately or later. Also, the apps created the opportunity for teachers to track student login history and quickly generated a report that shows each student's answers to the quiz and their quiz score. Four student quotes about instructional affordances are: "It keeps records of our login/logout times," "The app made it easy for teachers to get all students involved in the activi-ty," "Teachers instantly gather students' feedback and give comments," and "Teachers see the sta-tus of each student's work, their progress and answers".

Unfortunately, there were several constraints that may limit teaching and learning. First, students from the Socrative group said the app crashed multiple times, so they had to retake the quiz. One of the student quotes is "The app won't respond." From the Zuvio group, students reported they could not submit their answer multiple times to the same question. Once students clicked the `submit` they were unable to go back and change any answers. A few other students expressed concerns about cheating. They noticed some students comparing answers or looking to peers for cues, and thought such behavior was wrong because it provided an unfair advantage.

Discussion

In this study consisting of three groups of undergraduate students, we found that the six-week ex-periment of Socrative substantially increased reading comprehension and vocabulary. Most of the participants benefited from using Socrative compared with using Zuvio, and the average increase in test scores was around 8.5%. When using Socrative, the participants also became involved more with the question-answer activity. Simply being involved more,

however, was not the sole mecha-nism for the increased test performance. When using Socrative, the participants were more in-volved in the activity, and more of those involvements were active.

A higher percentage of students using OSRS participated actively and stayed focused for most (>90%) of the question-answer activity than the classical group. This matches Lim's (2017) find-ing that Socrative improved concentration in the classroom. The positive change could be partially due to the students' anticipation of obtaining a fast, personalized and private feedback for their work (Freeman et al., 2006). The improvement might be caused by novelty. Students did better because the classroom became different and interesting. This novelty effect will probably fade away as soon as students gradually become used to the systems. Another form of bias that we could not avoid was the Hawthorne effect—students work harder and perform better when they are being observed. To reduce such effect, we decided to conduct our study as part of a lesson cycle so students would be more likely to act naturally.

When assessing Socrative and Zuvio, researchers found their free versions easy to set up, use and administer. Without calling on students for answers, teachers were able to evaluate particular needs of students. While students had grown up in a world surrounded by technology, it would be dangerous to assume each of them could use Socrative or Zuvio immediately after a short training session. Most students still needed teachers as a guide to help them use these digital apps in order to stay engaged in the learning activities. Researchers also found they preferred the app stability with Zuvio overall, but multiple submission of Socrative was necessary if students wanted to make updates to their submitted answers.

Limitations

The limitations of this study should be noted. First, after we completed our interpretation of the findings, we discovered that the way in which we collected the data limited our ability to conduct a full analysis of the results. This study suggests a need in future research to revise the survey for gathering more information on different levels of familiarity with tech or different levels of dis-positions towards the use of tech in the classroom. Second, the time available to investigate our research problems and to measure change within the students' reading skills is constrained by the end date of our one-year grant. The experiment was conducted out over only six weeks, so it was too short to conclusively determine that the true effect of using OSRS on academic performance. The treatment might be effective only when it was new to students, and the success would not be repeated over the long term. To increase our ability to measure the effect, longer intervention du-rations (Chwo et al., 2018) of eight weeks or more, are recommended for future studies focused on student response systems and active learning strategies.

Conclusion

It is clear that the two apps Socrative and Zuvio can provide the desired anonymity, instant per-sonalized feedback and multi-sensory instruction, which were positively linked to student willing-ness to actively participate in large class activities. While openly asking questions and allowing all students to process and respond to teacher prompts is now possible on Zoom with a large class of undergraduates students in a typical university classroom, the findings in the study are im-portant for teachers who are struggling to engage all of their students, especially when the class offers in-person and online learning at the same time. The study also needs to be replicated with a longer intervention plan to judge with confidence whether or not the use of question-answer activ-ities in conjunction with the online student response systems improves test scores in vocabulary and reading comprehension tests.

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Appendix

Appendix A

Student Response to Instruction (DeMonbrun et al., 2017)

In this course, when the instructor did the Question & Answer activity, how often did you react in the following ways?

1. I did not actually participate in the activity.
2. I distracted my peers during the activity.
3. I pretended to participate in the activity.
4. I felt the effort I made helped me to learn English.
5. I participated actively (or attempted to).
6. I saw the value in the activity.
7. I felt the time used for the activity was beneficial.
8. I enjoyed the activity.

Response options for each item are: 1 = almost never (<10% of the time); 2 = seldom (~30% of the time); 3 = sometimes (~50% of the time); 4 = often (~70% of the time); 5 = very often (>90% of the time).

Appendix B

Interview Questions

1. Did the use of OSRS (Socrative/Zuvio) affect your attendance/participation in this class?
2. Do you think OSRS would be beneficial in both large and small classes? Why or why not?
3. What do you feel is most beneficial about OSRS? What do you feel are some limitations to OSRS?
4. What did you like best about your teachers using OSRS? What did you like least about your teachers using OSRS?
5. Do you feel the use of OSRS supports your English learning? Why or why not? In what ways?
6. Is there anything your teacher could do with OSRS to enhance your learning?
7. Is there anything else you would like to tell me about the use of OSRS?

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A qualitative single-case study exploring the impact of a mentor and cohort on students' academic and career decisions

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Abstract

Exposure to research is known to play a positive role in undergraduate education. However, robust research responsibilities are oftentimes not formally incorporated into a student's academic experience until master level studies. Further, a variety of intimidation factors often inhibit many undergraduate students from participating on a research team. In this case study, the research team evaluated a unique group of undergraduate researchers who matriculated to the same university after beginning to participate in research as concurrently enrolled students. Following matriculation, each student continued to participate in research throughout the entirety of their undergraduate studies. All of the study's students were STEM majors and undertook this research, both prior to and following matriculation, in the same lab and under the same mentor. This arrangement removed many of the common barriers to students participating in undergraduate research, such as the intimidation of working with strangers, including graduate students, and unclear expectations for undergraduate lab students from faculty. Consequently, the unique circumstance presented in this work affords the opportunity to more fully explore the influence that a strong long-term mentor and extended participation in research have on students' post-graduate decision making.

1.0 Introduction

The Gaetz Aerospace Institute (GAI) at Embry-Riddle Aeronautical University provides a concurrent enrollment model (CE) to over 85 high schools across the United States. The concurrent enrollment model offers college-credit coursework taught by college-credentialed instructors, oftentimes serving in dual roles as high school teachers on the student's high school campus (nacep.org, 2020). This latter characteristic is commonly used to differentiate the concurrent model from the dual enrollment (DE) model, where students leave their high school campus, most often undertaking coursework at their local community or state college (Witkowsky & Clayton, 2020).

Embry-Riddle, through the GAI, specifically offers science, technology, engineering, and mathematical (STEM) oriented coursework that expose students to undergraduate degrees that may appear otherwise intimidating. The coursework administered at the high school reflects the pedagogical, theoretical, and philosophical orientation of Embry-Riddle courses. Further, Embry-Riddle residential faculty provide course-specific training regarding course curriculum, pedagogy, and assessment criteria to the concurrent enrollment instructor.

One faculty member transitioned to Embry-Riddle's Daytona Beach residential campus following seven years of service with the GAI. During his tenure with GAI, the faculty member instructed a variety of concurrent enrollment courses and maintained an active research agenda that involved concurrently enrolled students. Upon matriculation to Embry-Riddle's main campus, one student enrolled in a meteorology degree program and four students undertook studies in engineering physics. Each of these students remained engaged in undergraduate research with the faculty member while he continued to serve in a strong mentoring role. This unique circumstance, with a relationship that spanned six to seven years for each student, provided an opportunity to investigate the role that substantive early exposure to rigorous academic research plays in an undergraduate student's academic experience as well as their post-graduate educational or career selection decision. Following a review of the applicable literature in section two and a specific stating of the research questions and the methodology employed in sections three and four respectively, the findings are put forth in section five. Section six acknowledges the limitations of the study prior to succinctly summarizing the conclusions and plan for future work in section seven.

2.0 Literature review

2.1 Dual/concurrent enrollment

Many students who participate in DE programs gather a sense of responsibility for their education sooner than those of their peers who enter college without a DE background (Lile et al., 2017). This reason alone is significant enough for high schools to encourage their students to enroll in dual enrollment programs. However, most of the research about the transferability of DE experience does not continue beyond the first-year experience at the undergraduate level. Relationships prove essential in STEM fields where students often feel intimidated by the content or the perception of what the content may demand of them. Being embedded into a community associated with this potentially intimidating field early on can ease the transition to studying it despite the challenges of moving away from home and entering a new environment (Tenenbaum et al., 2017). Much of this research is rooted in near peers or mentorship relationships that are less formal in nature.

Many studies previously conducted included data on first-year undergraduate performance, student perception of preparedness for college, and opportunities for first-generation college students or those from low-income economic status. These are all evaluated on an individual experience. This study, however, looks at how relationships built during students' CE experience and how this translates to decision making throughout the duration of their undergraduate studies and, later, into decisions regarding post-graduate activities.

2.2 Undergraduate research

Amaya et al. (2018) found that students who engage in undergraduate research are more engaged in their academic success and gain skills including "team ethics, problem-solving, and communication skills" which are all skills that employers, from all fields, continually use during new hires interviews (p. 2). When evaluating students' perceptions of a summer undergraduate research experience, Trott et al. (2018) found that "several participants recalled feeling more independent, self-confident, and intrinsically motivated as a result" of participation in the summer program (p. 75). This might provide an advantage to a student when applying for a position immediately following graduation. This may also serve as the "experience required" component that many companies demand, even of new graduates. These advanced skills often come from having a strong advisor who can guide students, not only in research but also in their future academic and career goals (Amaya et al., 2018; Bradley, 2013).

One comparative study, undertaken at the University of Arizona, questioned alumni of their Undergraduate Biology Research Program (UBRP) and College of Medicine (COM) 22 years following graduation regarding the impact that their undergraduate research had on their current positions. Some significant results from their survey include that "seventy-one percent of the COM respondents indicated that they had a mentor who had been an influential role model," with 66% of the UBRP respondents answering similarly (Yaffe et al., 2014, p. 29-30). Also significant, one-third of the UBRP respondents who had a negative research experience, attributed the negative experience to having a bad experience with the mentor. The interaction between the mentor and mentee in undergraduate research helps establish the culture of research within the mentee themselves. This translates into student's persistence, willingness to take on more challenging coursework, and the perception of their capabilities in research and coursework. Subsequent to this, these perceptions influence the career positions that

these students see as being achievable (Byars-Winston et al., 2015). The body of associated literature continues to solidify the idea that undergraduate research provides confidence, positive self-perception of ability, and willingness to pursue either a career in STEM or post-graduate work in STEM. These skills are not only essential to succeeding in STEM related fields but are exceptionally challenging to teach in a classroom setting (Behar-Horenstein et al., 2010).

2.3 Data analysis & theoretical framework

The data analysis for the investigation was purposefully undertaken. First, all interviews were transcribed and sent back to the participants for review and approval. After receiving the approval from the participants, the researchers read the transcriptions of the interviews individually and exercised memoing as they immersed themselves in the data. While reading through the transcripts, the researchers created notes in the margins of the data, beginning with the development of the codes and then the formation of themes from the codes. This coding strategy for its major categories of information is referred to as open coding (Creswell & Poth, 2018). Merriam (2009) suggests that assessing the codes is the initial step in categorizing and gathering meaning from the data. Furthermore, reviewing open codes and grouping similar data together into axial codes created "coding that comes from interpretation and reflection of the meaning of the data" (Merriam, 2009, p. 180).

Tinto's (1993) theory of student departure was the conceptual framework for the study. There have been five areas that Tinto (1992; 1975; 2012) has identified, as his conceptual model has evolved, that deter persistence among students in higher education: expectations, advice, support, involvement, and learning. However, the theory of student departure makes a strong argument to validate that the interactions between perceptions and behaviors of students play a key role in the integration and persistence in academic environments. Given the unique circumstances of the present study, Tinto's (1993) theory of student departure enabled the researchers to remain focused on how a faculty member's expectations, advice, support, involvement, and facilitation of learning impact students' post-graduation decision-making.

3.0 Problem statement & research questions

3.1 Problem statement

Most students find that research is intimidating due to a lack of exposure to the process and, consequently, avoid the experience altogether. Students who are introduced to research in their undergraduate studies oftentimes do not get fully immersed in the experience and, thus, the experience can be intimidating. This results in minimal participation in publishing, presenting, or otherwise (Villa et al., 2013). Currently, it is not known how early and substantive exposure to research, beginning as early as high school concurrent enrollment, influences post-graduation decision-making.

3.2 Research questions

The research question being posed to this group are:

RQ1: How does early exposure to research impact a student's decisions at the time of degree completion?

RQ2: Why are students who engage in research early in their academic career more likely to choose research-based career paths?

3.3 Phenomenon

The purpose of this qualitative case-study is to understand how early research exposure impacts undergraduate students' academic and career decisions following graduation. At this stage in the research, early exposure to research can be generally defined as the introduction to undergraduate research practices at a college freshman level or earlier. Such exposure could range from conducting literature searches to collecting data or executing the research itself.

4.0 Methodology

4.1 Participants

This case study uses the experiences of five public school students who first engaged in research as concurrently enrolled students through the GAI at Embry-Riddle Aeronautical University (see Table 1). Following completion of their high school diploma, each matriculated to Embry-Riddle Aeronautical University's Daytona Beach residential campus to earn their bachelor's degree. Four of the five participants chose a major in Engineering Physics, the fifth double majoring in Meteorology and Computational Mathematics. Three of the Engineering Physics majors also minored in various programs, including Applied Mathematics, Aviation Law, Computer Science, and Computer Engineering. Of the group of five, two participants have immediate plans to pursue a graduate-level degree, while two others are entering into industry immediately after graduation. The final participant intends to pursue a graduate degree following one year of full-time employment in a Federal Work-Study program.

4.2 Procedures

This research aims to draw conclusions from a purely qualitative research approach. Yin (2014) states that a case study is useful for answering the questions of how and why for a social problem, such as what encourages students to pursue research activities at the undergraduate level of education. Moreover, Stake's (1995) exploratory single case study approach was selected because it utilizes a constructivist foundation that complements the educational context of this study. The literature supports a gap in research regarding extended research experiences commencing prior to a student entering a higher education institution (Amaya et al., 2018; Claessens et al., 2016; Lile, 2017). Data

Table 1: Participants (pseudonyms)

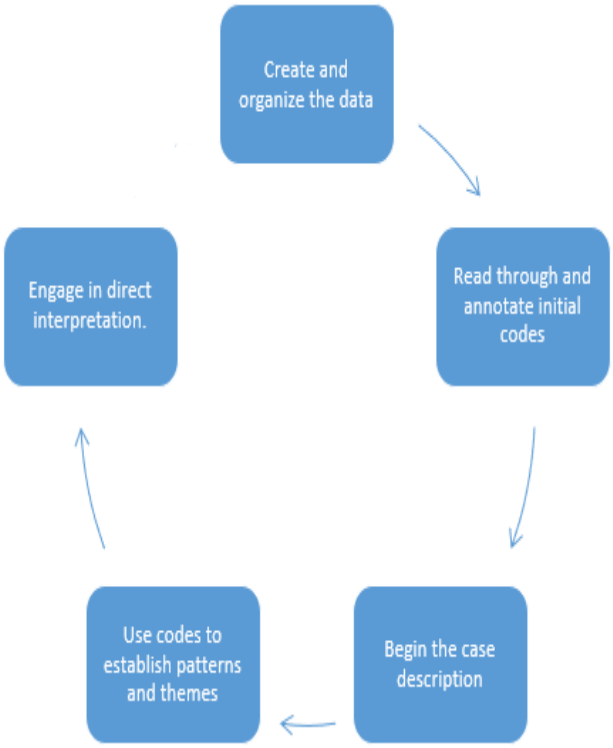
PSEUDONYM	Major(s)	Minor(s)	Post-Graduate Plans
CARSON	BS. in Engineering Physics	Applied Mathematics, Computer & Electrical Engineering, Computer Science	Pursuing a M.S. in Engineering Physics, then plans on pursuing a Ph.D. in Cosmology
ELIJAH	BS. in Engineering Physics	Applied Mathematics	Industry
JACKSON	BS. in Engineering Physics	Applied Mathematics & Aviation Law	Pursuing a M.S. in Optical Physics, then plans on pursuing Law School
LIAM	BS. in Engineering Physics	Applied Mathematics, Computer & Electrical Engineering, Computer Science	Civilian physicist for the U.S. Military and pursuing his M.S. in Applied Physics
OLIVER	BS. in Meteorology & Computational Mathematics	None	Industry, turned down full ride for M.S. Plans to return for a Master's degree after two years industry experience

was collected from interviews and three short individual narratives. The narratives probed the experiences that the students had while undertaking research as concurrently enrolled students. Each narrative was between 200-300 words in length. The five participants satisfy both Yin (2014) and Creswell and Poth's (2018) suggestion for employing at least five participants for purposeful sampling. It is important to note that this study was not designed to yield generalizable results but to generate an understanding of the phenomenon and lay a foundation for future inquiries.

4.3 Data analysis & theoretical framework

The data analysis for the investigation was purposefully undertaken. First, all interviews were transcribed and sent back to the participants for review and approval. After receiving approval from the participants, the researchers read the transcriptions of the interviews individually and exercised memoing as they immersed themselves in the data. While reading through the transcripts, the researchers created notes in the margins of the data, beginning with the development of the codes and then the formation of themes from the codes. This coding strategy for these major categories of information is referred to as open coding (Creswell & Poth, 2018). Merriam (2009) suggests that assessing the codes is the initial step in categorizing and gathering meaning from the data. Furthermore, reviewing open codes and grouping similar data together into axial codes created "coding that comes from interpretation and reflection of the meaning of the data" (Merriam, 2009, p.180). Figure 1 depicts a visual representation of the data analysis steps.

Figure 1: Case-study data analysis visualization



Note: This figure is an adaptation of Creswell & Poth (2018) data analysis and representation by research approaches table (p. 199).

Tinto's (1993) theory of student departure was the guiding theory chosen to frame the present study. There have been five areas that Tinto (1992; 1975; 2012) has identified, as his conceptual model has evolved, that deter persistence among students in higher education: expectations, advice, support, involvement, and learning. However, the theory of student departure makes a strong argument to validate that the interactions between perceptions and behaviors of students play a key role in the integration and persistence in academic environments. Given the unique circumstances of the present study, Tinto's (1993) theory of student departure enabled the researchers to remain focused on how a faculty member's expectations, advice, support, involvement, and facilitation of learning impact students' post-graduation decision-making.

4.4 Personal perspectives

The applicable faculty advisor that transitioned from the high school program to the University is one of the paper's authors. Consequently, this individual did not formulate

any of the student questions so as to not lead the students' answers toward any particular outcome. Further, this research team member was removed from the data collection portion of the project as to not influence the students' responses, perceptions, and descriptions of the questions during any of the interviews. Therefore, these measures taken by the authors can be considered a delimitation for the present study.

5.0 Findings

One of the questions that the research team sought to explore with this cadre of students, and the specific focus of this work, is the role that working with the same mentor and student cohort from concurrent enrollment through undergraduate graduation had on the students' subsequent academic and career decisions. To obtain this insight, students were both individually interviewed and asked to offer written responses to three prompts. To ensure the integrity of the students' answers, each student was informed that the confidentiality, anonymity, and privacy of their responses would be protected and that they could withdraw from the study at any point in time without consequence. Individual interviews lasted for an average of 15 minutes each and the researchers obtained 14 pages of transcribed text in total from the five participants, totaling approximately 7,000 words. Following the interviews, students were asked to provide 100-200 word responses to three narrative prompts inquiring about their rationale to pursue or not pursue graduate-level higher education. These responses resulted in nearly 2,100 words spanning approximately four pages. The interviews and the narratives were coded together and resulted in 233 coded frequencies (see Table 2) leading to a total of three central themes coded from preliminary data analysis. The most prevalent themes that emerged were: connection to industry, motivation through research, and relationship over time.

Table 2

Theme	Files	Coded References
Connection to Industry	6	80
Relationship over time	6	77
Motivation for Research Agenda	8	76
TOTAL		**233**

5.1 Connection to industry

Students, upfront, frequently expect an undergraduate research experience to reflect the college laboratory experiences that they have experienced to date, where procedural guidance is provided and the desired outcome is planned (Linn et al., 2015). However, there was a general sentiment across the cohort that participation in an unscripted intellectual endeavor, that is to say, the research that the students concurrently participated in, was one of the more enjoyable aspects of their concurrent enrollment and undergraduate experience. More to the point, the less scripted nature of the work in the mentor's lab was perceived to be more reflective of the daily tasking that each was working toward following graduation. This perception drove subsequent academic and career decisions and highly influenced the student's feeling of job and graduate school readiness.

Besides the stated reward brought about by the mentor, "treating us as engineers and expecting us to come up with a practical product," there was profound value perceived in the development of ancillary skills, not typically developed in the classroom, that the students felt better prepared them for industry or their other post-graduation plans. Elijah attributed the extended research experience to, "helping me develop things that cannot be seen on paper, like professionalism, writing an email or useful report, appropriately structuring a spreadsheet or commenting a code." Jackson believed that the ancillary skills that Elijah highlighted, "might take a few weeks or months to develop on the job" and that the opportunity that this experience offered, "to develop or improve these skills before getting a job provides an advantage." Liam singled out the mentor's, "advice on how to reach out to a vendor or supplier when a problem is encountered" as being invaluable when heading into industry. The consensus on the perceived value in developing these ancillary skills is a benefit not often touted in lieu of or complementing the more often promoted gains in intellectual, academic, and research maturity (Byars-Winston et al., 2016).

Each student also saw tremendous value in the opportunity that their extended undergraduate research experience provided to preliminarily 'test' their expressed industry interest before completing the entirety of their upper-level courses. This was specifically enabled by the opportunity to begin an undergraduate research experience during their concurrent enrollment, along with the opportunity to undertake relevant coursework early in their concurrent enrollment. Oliver noted that his work in the mentor's lab revealed an affinity for working with big data and subsequently led to undertaking a dual major in computational mathematics. Oliver shared that the experience allowed him to, "learn about myself and was helpful to find a career that I wanted to at least start off in." Carson pointed out that,

> I know people who have changed their major because of a project or internship. They realized that they didn't actually want to do something for the rest of their life. While this was not my experience, I was still thankful for the chance.

Liam stated that it was the research that he participated in that dictated the type of masters program that he wanted to undertake because it helped him, 'think through things that I do and don't like," and, similarly, Elijah broadly stated the "research exposure showed me the options that the world has to offer."

In conjunction with the general research experience, and how it informed future decisions, was the role of the mentor themself and the industry perspective and networking opportunity that the mentor provided. The close relationship

that each of the students developed with the mentor resulted in a multitude of varied outcomes that further informed their subsequent decisions and their perceived readiness for what came next. Outcomes spanned from several students feeling as if their contributions were more valued, assistance in building a code of professional ethics, direct guidance in applying concepts learned in the classroom, and just having someone you could attempt to emulate. In addition to the fondness for working with a mentor that exhibited passion, that multiple students pointed out, Jackson found it beneficial to, "have a former industry professional who has been through a lot of different situations in life as a sounding board" but also found additional value in the network that he was able to plug him into. Furthermore, Jackson shared,

> [My mentor] was able to refer me to a friend who received an undergraduate degree in engineering, went on to law school, and became a patent attorney. This conversation helped me find a career path that fit with my interdisciplinary interests.

Overall, the perception that the extended research experience more closely mirrored the nature of industry tasking, along with the personalized perspective that the mentor provided for industry, provided a feeling of being better prepared for post-graduation endeavors and increased confidence in the decisions that they have made to date.

5.2 Motivation through research

The second major common theme that emerged from the interviews and surveys was how the research, close-knit student cohort and mentor emboldened the individual cohort members to seek ambitious goals and persevere during the challenges that inevitably followed. For Oliver, "the research showed me what I was capable of" and, for Elijah, "it showed me that I could be successful even when my class grades did not necessarily reflect that. I would have had no hope in completing this degree if the only feedback I received was from the classroom." When Liam was offered the opportunity to enter into the research group via an early concurrent class capstone project, and after being captured by the material of his first concurrently enrolled class, he stated that he "made a complete 180 degree turn and fully dove into academics and studying." Later, when Liam had the opportunity to publish and present at professional conferences, "besides helping me grow, it totally changed the way I viewed myself in that I could not have previously seen myself doing things like this." For Carson,

> Participation in GAI and continued research during my time on campus prevented me from fading into the background, which I think can happen a lot. On a small team, I knew I would have more interactions with peers and the professor and that this would keep me engaged.

Jackson said that his participation in GAI assisted him in doing exactly what he set out to do, "I always wanted to push my academics as far as I could from an early age. The Gaetz program provided an avenue to do exactly this." Upon reflection and observation, Jackson was already able to identify how research motivated many of his peers external to the cohort, along with classmates at his University. Jackson, continued, "During my study away and internship, I've seen a lot of kids who have done research early on go on and pursue their Ph.D. or get a big time job at SpaceX or a company like that."

Carson stated, "The support system provided by the group during concurrent enrollment made the idea of doing this degree and doing something out of the ordinary seem possible." For all, the support system created through the close-knit cohort provided reassurance and reduced the intimidation factor. Jackson shared that he, "had plenty of passion but there was still intimidation. The group provided someone to reach out to when you were afraid." Liam put forth, "I think it worked out well because we all developed a good rapport back in high school and got to know one another because we knew that we were undertaking something challenging." Elijah gained confidence in simply "seeing that people with the same background as me were accomplishing similar coursework and research as an undergraduate." Overall, as the students accomplished more and more formidable challenges, it bred confidence.

While Oliver similarly found that "[the mentor] provided encouragement to pursue my goals and the confidence to face an intimidating task," discussion unveiled that the mentor had a far more nuanced role in how the mentees approached their future endeavors. Jackson specifically recalled leaving his high school campus and coming back for evening activities and still finding his professor there, "Seeing the accumulation of all of the hours that I saw him put into research and the tangible product, it motivated me to dedicate myself to something." Many years later, Elijah attributes this instilled work ethic to getting him his first internship and a future job offer,

> While I had worked on a small class project in the past in electro-optics, I had no real relevant experience. My boss was motivated to hire me despite not having any real experience because of the work ethic that I was able to demonstrate through my research products from the lab.

For Carson, "Professor taught me how to factor in a practical perspective but what [they] really instilled was a hard work ethic." While Liam previously attributed the cohort experience to him making a 180 degree turn in how he approached his studies, he went on to say that, "The program and instructor helped me realize that to do what I wanted to do that I was going to have to put in a lot of extra work and make some changes. His passion motivated [sic]."

5.3 Relationship over time

With the important role that comradery played within the cohort already being addressed, the extension of this feeling toward the mentor is also evident. However, student feedback spoke directly to the strong role that this relationship played in long-term decision-making. Liam acknowledged that,

> When I look back on my life I know that there will be a handful of people that really changed the direction of it. Sometimes good and sometimes bad. But, when I look back on my life I know [mentor] will be one of the people who is going to have the biggest positive influence on it and its direction.

Liam went on to further say,

> I truly struggled to decide what I wanted to do for college but thanks to [mentor] and the GAI program, I was able to choose a degree in Engineering Physics. I'm not sure that this would have been possible without the guidance of [mentor] and the program. [Mentor] is somebody I would like to continue to have in my life and have a continued relationship with.

However, the longevity of the mentoring period and how it consequently blended the nature of the mentoring to both personal and professional guidance, appears to be the most impactful aspect of the relationship. Jackson noted that, "We see [them] every week. So, it got more and more intimate. It was professional but a friendly environment." Oliver characterized this fluidity as "a very seamless transition between professional mentoring and mentoring on a more personal level." Ultimately, this dynamic led to a fundamental shift in how the students viewed a faculty member, an increase in research productivity, and a more mature evaluation of future options. Jackson said that the nature of the relationship "humanized professors." Many within the cohort felt that the close relationship increased research productivity, with Elijah sharing that, "we knew what to expect and what he would demand of us," and Carson indicating that, "Our relationship with [mentor] enabled a faster progression of results in the lab because we were not fearful of presenting our results." Jackson and Carson saw an analogy between life and the undergraduate research experience that they participated in. Jackson offered,

> There are a lot of life lessons that go along with undergraduate research. You try to tackle problems with the knowledge that you have but there is a lot that you don't know. Each have [sic] a lot of problems that you have never encountered before.

Carson found that, "both research and the real world don't have clearly defined problems or solution manuals." However, Liam jumped in and stated, "The way [mentor] structured [they] questions prompted us to think, self-interview, self-analyze and determine if this was the best way to solve a problem. This method has guided my overall decision-making process."

6.0 Limitations

Qualitative research aims not to make a generalization but to gain a deeper understanding of certain phenomena (Creswell & Poth, 2018). The researchers were particularly interested in the process, meaning, and understanding of the participants' lived experiences. The sample size was a limiting factor in this study, as the researchers focused on the richness of the data collected rather than its generalizability. Also, the research site was another limiting factor as the findings cannot be extended to broader populations with the same degree of certainty that quantitative analyses can. However, a pure qualitative case study methodology was needed to understand how a faculty mentor can encourage students to pursue research activities at the undergraduate level of post-secondary education.

7.0 Conclusion & future research

7.1 Conclusion

In keeping with the case study purpose, this research further significantly contributes to the body of literature on students' perceptions of research. Using the framework outlined by Tinto (1993), the investigation was able to support his concepts that faculty advisors play a critical role in student success when they embark on future endeavors. Ultimately, three major themes emerged from this case study: relationship over time, connection to industry and motivation through research. Each of these themes align with Tinto's (1993) theory of student departure and the resultant persistence that occurs within a student. While persistence was not a common theme that explicitly emerged, it can be indirectly connected to all of the major themes observed.

In this case study, the participants all expressed that the faculty advisor was a key aspect of their success during their undergraduate experience as well as a support structure when it came to making decisions about their future. Establishing this relationship early in the student's higher education experience, and allowing this relationship to evolve over numerous years, afforded the students a unique and more personalized relationship with the mentor and, consequently, more personalized mentoring with the faculty advisor compared to what they experienced with other professors that they worked with over a shorter time frame. While not all students chose to pursue graduate education as their next step, none of them felt that it was outside of their capabilities. This result lead this team to conclude that RQ 1 can be answered by stating that students' confidence in their career field as an entry level professional is positively impacted by early exposure to research. The students who chose to go directly to industry, rather than graduate school, also expressed the importance of their undergraduate research experience in their ability to obtain employment following degree completion. Further, it emboldened their confidence in their ability to contribute within their desired industry. Finally, the connection they perceived between the research and their future careers provided continued motivation while progressing through their coursework. These results indicate that higher education institutions should make significant efforts to not only create opportunities for student research but also incentivize peer recruitment into these projects.

The participant size was too small to conclusively answer RQ 2. Additionally, more time would need to pass to answer this question in totality. Two of the participants are pursuing graduate research and both of them plan to continue through a terminal degree. Another participant plans to return to graduate school and pursue research efforts after

their initial year of contract work while another plans on a similar path of returning after some time in industry. While 80% of the participants are pursing graduate level research or plan to return in the near future, further research to determine if this actually happened is required.

7.2 Future research

Future research efforts should be undertaken to expand analysis of this entry level data to larger scale evaluation of the impact of students' early engagement in research with a long-term mentor and how this impacts post-graduate performance. Implementing the aforementioned strategies into groups of different degree programs will give a more objective indication that our found themes have on students' post-graduate paths. Additionally, incorporating a gender mixture could provide further insight as, traditionally, science and engineering have been male-dominated professions. Finally, following up with this set of students after a number of years may prove beneficial in adding to the understanding of how this research experience truly connected to their career applications; contrasting their perceptions against that of colleagues who did not have an analogous undergraduate research experience.

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Determinants of university students' performance: Evidence from undergraduate economics students from a Bangladeshi University

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Abstract

There is currently a research gap since no study systematically explored the factors impacting the performance of Bangladeshi university students, especially those studying economics. In this paper, we define and estimate an econometric model to explain the variation in the academic performance of undergraduate economics students. A student's ability, effort and motivation, and household attributes explain significant variation in university economics students' performance in semester final examinations. Among the ability variables, performance in previous semesters, higher secondary performance, English proficiency, having studied economics at the pre-university level, and having a science background come out as important determinants. Among the variables grouped as 'effort and motivation,' daily study time, the number of courses retaken, and best friend's past performance matter significantly. Up to a certain level, students with higher household incomes tend to perform better. Also, students from the local district tend to outperform others. With a mandatory attendance policy, making a minimum percentage of attendance binding in place, attendance fails to register any substantial impact. Also, the endogeneity of attendance could not be established.

Introduction

Like other growing economies around the world, Bangladesh is increasingly becoming knowledge-driven. The service sector contributes more and more to the GDP each successive year. The share of the service sector in GDP was 54% in the fiscal year 2020-2021. The size of the service sector was 18.98 trillion Bangladesh taka (BDT) in the fiscal year 2020-21, experiencing an increase of BDT 8.92 trillion in the last 5 years (BER, 2021). During the previous several years, the number of public and private universities has increased significantly, and so did the number of economics departments and the number of students enrolled in economics. There are 161 universities in Bangladesh (University Grants Commission of Bangladesh, 2022). The quality of education affects productivity and social development and thus impacts economic growth (Hanushek & Woessmann, 2007; Raitano & Vona, 2013). Hence, policymaker needs to keep an eye on student performance (Giambona & Porcu, 2015). Currently, significant changes are taking place in the universities of Bangladesh as the Government has undertaken various programs to ensure quality higher education. Universities are now under greater performance scrutiny for their crucial role in a knowledge-based economy.

A university's performance is reflected in the graduate's capacity to serve society, which cannot be measured directly. However, a university has its performance evaluation system to appraise how much its students are imbued with knowledge, measured by academic grades. Since students' ability to contribute to the development of society is a major concern for policymakers and educators at higher learning institutions, it is imperative to study the factors affecting students' performance, which would help policymakers devise policies to raise students' contribution to the country.

A cursory glance at a recently published result of the term final examination of a batch of 63 undergraduate economics students at a Bangladeshi university reveals that on a scale of 4, 35 students achieved 3.00 and above, only four of them achieving 3.50 and above. 28 students, i.e., 44.45%, scored below 3.00. Given that a grade point average (GPA) of at least 3.00 is usually considered as reflecting a satisfactory performance, these statistics bring forth an essential question: What determines university-level economics students' performance? To address this question, we need to identify the factors that affect the performance of a university economics student.

Presently, there is a research gap in the context of Bangladesh, as no study has advanced to diagnose the factors responsible for students' performance at the tertiary level. Although Asadullah et al. (2007) examined the determinants of the performance of high school students, no study explored the factors impacting the performance of Bangladeshi university students. Using data on undergraduate economics students, this paper investigates how students' attributes and household attributes impact their academic performance.

The paper's organization is as follows: this introductory section is followed by a brief literature review. Section 3 describes the methodology. Section 4 estimates the model and reports the results. Section 5 provides a discussion of the results, and section 6 concludes.

Literature review

Existing literature in the field has identified several factors exerting substantial influence on student performance in different settings. The determinants identified include student effort and previous schooling (Siegfried & Fels, 1979; Anderson & Benjamin, 1994), parental education and family income (Devadoss & Foltz, 1996), self-motivation, age and learning preferences (Aripin et al., 2008), and attendance (Romer, 1993).

Following Newman-Ford et al. (2009), factors contributing to a decline in student attendance in recent years include assessment pressures, poor lecture delivery, lecture schedule, and job constraints. Also, advancements in information technology and financial constraint have increased the number of 'part-time' students. However, many studies support the notion that students missing classes perform poorly compared to students who attend classes (Devadoss & Foltz, 1996; Durden & Ellis, 1995; Romer, 1993; Park & Kerr, 1990; Schmidt, 1983). Many such studies failed to separate attendance from other characteristics like motivation, intelligence, prior learning, and time-management skills.

In an influential paper, Romer (1993) reports the presence of rampant absenteeism, based on data on economics courses at three U.S. universities. Absence was related to the poor performance of the student. However, no causal effect was established due to the potential endogenous relationship between attendance and performance. Romer's article (1993) led to a slew of research. Durden and Ellis (1995) surveyed 346 students on a single course at a U.S. university. They found a critical level of absenteeism, after which the average 'modest' adverse impact becomes substantial. Cohn and Johnson (2006), who studied first-year economics students from a U.S. university from 1997-2001, also support the view. Devadoss and Flotz (1996) surveyed students across four U.S. universities taking a course in agricultural economics. They estimated a positive impact of attendance on performance. The study used proxies to measure unobserved characteristics like prior attainment, effort, and motivation. Stinebrickner and Stinebrickner (2008) also exploited survey data to generate proxies and carry out Instrumental Variable (IV) estimates. Stanca (2006) used panel information on microeconomics students at an Italian university. Considering the unobserved characteristics, he found a significant positive causal impact of attendance on performance. Arulampalam et al. (2012) used panel data for economic students at a U.K. university. They controlled for unobserved heterogeneity across students to address the endogeneity between absence and academic performance. The findings identified a causal effect from absence to performance, especially true for better-performing students.

Marburger (2001), analyzing information on 60 first-year microeconomics students, found a significant positive relationship between attendance and performance. Marburger (2006) found that mandatory attendance policy enhances student performance in a later study. Kirby and McElory (2003) used the travel time to college as the

instrument. They saw attendance having a positive and diminishing marginal effect on performance at an Irish university. Dobkin et al. (2007) employed a discontinuity design approach. They found that making attendance compulsory improves attendance and final examination performance significantly. Neri and Meloche (2007) found similar results using Australian data for students enrolled in microeconomics courses.

Rodgers (2002) used data for an introductory statistics course at an Australian university and found a robust positive association between attendance at tutorials and performance. However, a policy aimed at raising attendance did not improve performance. For the U.K., Martins and Walker (2006) found no significant impact of class attendance on performance for economics students at a university.

Gamazo et al. (2015) pointed out that girls are usually better at reading than boys in mathematics and science. They argued that the sign and degree of the impact of gender could depend on the subject matter. Woodfield and Earl-Novell (2006), using a sample of around two million graduates, found female students doing better, which was attributed to their higher conscientiousness lowering their chances of missing lectures. Haist et al. (2000) showed a context-specific role of gender. Though Borde (1998) found no evidence of gender affecting performance, Borde et al. (1998) found gender (male), quality of the previous institution, performance in prerequisite courses, part-time work status as important determinants. Male students did better in class in Nyikahadzoi et al. (2013). Age and student organization membership had no impact in this study. Agasisti and Vittadini (2012) reported students enrolled a year before the usual age and students who lost a year in the past were performing less, i.e., age having a negative impact. Also, in Newman-Ford et al. (2009), older students had lower educational achievements than younger students. Also, Pholphirul (2017) and Karakolidis et al. (2016) underscores the role of age in student performance. However, in Richardson (1994), mature students' performance was not worse than younger students.

Dolton et al. (2003) had information on students' time in class and self-study activities at a Spanish University. Both activities had significant positive impacts on examination scores. Raychaudhury et al. (2010) and Kernann et al. (2011) listed several factors like attendance, family income, parental education, teacher-student ratio, number of trained teachers, gender, the distance of schools as factors affecting the performance of students. Hijaz and Naqvi (2006), analyzing data from private colleges in Pakistan, found a negative relationship between family income and students' performance. Yu (2011) found that math proficiency, English proficiency, relevant high school courses, and academic aptitudes affected student performance. Zimmerman et al. (1992) discovered a positive relationship between self-motivation and academic performance. Sirin (2005) found a moderate to a strong relationship of socioeconomic status, including income, with academic performance. Also, studies like Pholphirul (2017), Karakolidis et al. (2016), Adeyemi and Adeyemi (2014), and Ali et al. (2013) emphasize the importance of socioeconomic background.

Sattayanuwat (2015) used data on 75 students and estimated both logit and probit models to identify factors affecting student performance in a single course. The study chose the probit model for giving a higher log-likelihood ratio and pseudo R2. In this paper, gender played a role with male students performing better. Attendance also generates a positive impact. Other factors positively affecting performance are family income, if studied at public high schools, having a personal tutor, and students' attitudes. Sattayanuwat (2015) analyzed none of the papers that addressed attendance's endogeneity.

Bonacini et al. (2021) used student-level data on 8 EU countries and evaluated their performance in reading and mathematics. Their cross-country analysis identified the number of books at home, and school characteristics like the quality of a school and class size matter the most. Some of the few other studies that carried out the multi-country study are Lee and Barro (2001), Woessmann and Fuchs (2004), Hanushek and Woessmann (2013), and Masci et al. (2018). Almost all the multi-country studies used the same dataset, namely, the PISA survey dataset.

Some studies found immigrant students performing worse than native students (Giannelli & Rapallini, 2016; Tonello, 2016). However, Ammermueller (2007) and Schneeweis (2011) argued that the channel through which immigration status works is the relatively less well-off family background of the immigrant students than natives.

Students who perform well at high school or college are anticipated to do better at university. Many studies like Koh and Koh (1999), Duff (2004), Seow et al. (2014), and Jansen and de Villiers (2016) found prior academic achievement wielding significant impact on performance. Duff (2004), Byrne and Flood (2008), and Seow et al. (2014) identified prior academic performance as the most important determinant of students' current performance. Studies by Bartlett et al. (1993), Brahmasrene and Whitten (2001), and Gammie et al. (2003) found no significant impact of previous performance on current performance. However, all these studies focused on accounting students. Gracia and Jenkins (2003) and Gammie et al. (2003) accentuated the importance of past performance. They put forward the need to provide counseling to poor students.

Barlett et al. (1993) studied specifically if students had passed three particular courses. For Koh and Koh (1999), the measurement tool was a student's mean high school achievement. Seow et al. (2014) treated mathematical and non-mathematical aptitudes separately. Qualitative variables were used by Jansen and de Villiers (2016) to represent students' final year grades at high school.

Given the above literature review, there has not been any study that systematically analyzed the determinants of student performance at a Bangladeshi university to the best of our knowledge. In this paper, using the information on undergraduate economics students, we aim to achieve the following:

1. To investigate how student attributes such as ability, effort, and motivation, among others, influence university students' academic performance.

2. To examine how different household attributes impact student performance.

Methodology

Studies varied regarding the measure of prior performance. Often Grade Point Average (GPA) or Cumulative Grade Point Average (CGPA) have been used to quantify academic performance (Gracia & Jenkins, 2003). Some measured performance in a particular semester (Galiher, 2006; Darling, 2005; Broh, 2000; Stephens & Schaban, 2002), some looked at the result of a particular subject or the previous year result (Jansen & de Villiers, 2016; Hijazi & Naqvi, 2006; Gammie et al., 2003; Hake, 1988; Tho, 1994). In this paper, rather than analyzing student accomplishment on specific subjects, we analyze a student's performance in a semester and use GPA as the dependent variable. Following Coleman (1966) and Hanushek (2008), we conjecture that student performance, i.e., GPA, is the output of an education production function that reflects the relationship between academic performance and student attributes and household attributes. Assuming linearity in the parameters, we describe the multiple regression model,

$$y_i = \alpha_1 + \beta_1 x_{1i} + \beta_2 x_{2i} + u_i$$
$$y_i = student's\ academic\ performance$$
$$x_{1i} = student\ attributes$$
$$x_{2i} = household\ attributes$$
$$u_i = error\ term\ capturing\ all\ other\ factors\ affecting\ performance$$
$$i = 1, 2, \ldots\ldots, N$$

The variation in GPA is explained using several student and household characteristics. GPA in the most recent semester is assumed to indicate a student's academic performance. The prime traits that affect students' academic performance are factors like a student's ability, effort, and motivation, all of which are unobservable. The accurate estimation of β_2 is feasible if E(x_1i,u_i)=0. Nevertheless, ability, effort, and motivation are likely associated with performance. Abler students can give high effort, are more motivated, and are expected to perform better. Estimating β_2, omitting x_1, would generate a biased and inconsistent estimator owing to omitted variable bias. We circumvent this problem by finding proxy variables for student attributes and thus, estimate

$$y_i = \alpha_1 + \beta_1 x_{1i}^* + \beta_2 x_{2i} + u_i$$
$$x_{1i} = \gamma_0 + \gamma_1 x_{1i}^* + v_i$$
A consistent estimator of β_2 requires $E(x_{2i}, v_i) = 0$.

The University has varying prerequisites and entry exams for different faculties and students from different college education strands. We use past performance at the university level, Higher Secondary Certificate (HSC) GPA, English proficiency, prior economics courses, and, where applicable, studies in the arts/commerce/science group at the higher secondary level as proxies for ability. To measure effort and motivation, we use attendance, daily study time, number of retakes, if receiving any scholarship, daily time spent on social media, if the student studies in a group, and the performance of the best friend in the Department. The last variable also captures the peer effect. Apart from these traits, other student characteristics considered include age, gender, religion, and if the student is from the local district. Household characteristics included in the paper are the father's education, the mother's education, and the family income. Family incomes are grouped into six categories.

The University has a mandatory attendance policy. A student must have at least 70% attendance to sit for the finals in a semester. As identified by several studies, attendance can be endogenous. We will use the Instrumental Variable – Two-Stage Least Squares (IV-2SLS) technique to quantify the impacts of the performance determinants. The Durbin-Wu-Hausman test will be employed to check for the phenomenon of endogeneity. We surveyed undergraduate Economics students of a Bangladeshi University who have completed at least one semester. 139 students participated in the survey.

We expect that abler students will perform better. This will be vindicated if the proxies for ability collectively increase the model's explanatory power significantly. An F test can verify this. Also, the magnitude and the significance of the coefficient associated with a proxy can bring out meaningful insights. The importance of effort and motivation can be evaluated similarly. Likewise, the associated coefficient's sign and significance will appraise the impacts of other variables and their importance.

Because of the potential endogeneity of attendance, we use the Instrumental Variable Two-Stage Least Squares (IV-2SLS) regression technique to estimate the model. We use 'if the student lives on campus' and 'if s/he faced any problem including health and family issues in the previous semester' as the instruments for attendance. We argue that if a student lives on campus, it requires less time to travel to the class and positively affects attendance. Also, if a student faced health, finance, and family problems, attendance would be affected negatively.

Results

The second column of Table 1 reports the IV-2SLS estimates and the post-estimation statistics. The test of endogeneity, followed by the 2SLS estimates, reveals that both the Wu-Hausman F test statistic and the Durbin-Wu-Hausman Chi-sq test statistic have large p-values. Hence the null hypothesis that the endogenous regressor is orthogonal to the error term, i.e., attendance is exogenous, cannot be rejected, and 2SLS estimation is not required. This inference is similar to Kirby and McElroy (2003), who found no endogeneity of attendance and used and reported OLS results.

Table 1: Determinants of student's performance.

Dependent Variable = Student Performance (GPA in the last term)		IV-2SLS Coefficient (Std. Error) N=139	OLS Coefficient (Std. Error) N=139	OLS Coefficient (Robust Std. Error) N=139
Constant		-.84* (.48)	-.49** (.24)	-.49 (.30)
Student Attributes				
Ability				
Past Performance		.60*** (.05)	.62*** (.05)	.62*** (.06)
GPA in Higher Secondary		.13*** (.05)	.13** (.05)	.13** (.06)
Score in English in the Admission Test		.07*** (.03)	.06** (.03)	.06*** (.02)
If studied economics at the pre-university level		.04*** (.01)	.05*** (.01)	.05*** (.01)
Group in Higher Secondary (Science = 1)		.06*** (.01)	.06*** (.02)	.05*** (.01)
Group in Higher Secondary (Commerce = 1)		.03* (.02)	.02 (.02)	.02 (.01)
Effort and Motivation				
Attendance		.15 (.10)	.07* (.04)	.07 (.05)
Time spent in studying (hours/day)		.01 (.01)	.01* (.00)	.01* (.00)
Number of Retakes		-.02** (.01)	-.02** (.01)	-.02** (.01)
Number of Retakes squared		.00 (.00)	.00 (.00)	.00 (.00)
If receiving any scholarship (yes = 1)		.02 (.01)	.02 (.01)	.02 (.01)
Time spent on social media (hours/day)		.01 (.01)	.02 (.01)	.00 (.01)
If studied in a group (yes = 1)		.01 (.01)	.00 (.00)	.00 (.00)
Best Friend's CGPA		.13*** (.04)	.13*** (.05)	.13*** (.04)
Others				
Age (years)		.01 (.01)	.00 (.00)	.00 (.00)
Sex (male = 1)		-.01 (.01)	-.01 (.01)	-.01 (.01)
Religion (Islam = 1)		-.01 (.01)	-.01 (.04)	-.01 (.01)
If hails from the local district (yes = 1)		.02* (.01)	.02* (.01)	.02* (.01)
Household Attributes				
Father's Education (years)		-.01 (.01)	-.00 (.01)	-.00 (.01)
Mother's Education (years)		-.02 (.01)	-.02 (.01)	-.02 (.01)
Income Category II		.03** (.01)	.03* (.02)	.03** (.01)
Income Category III		.04** (.02)	.04** (.02)	.04** (.02)
Income Category IV		.06*** (.02)	.06*** (.02)	.06*** (.02)
Income Category V		.04** (.02)	.03* (.02)	.03 (.02)
Income Category VI		.02 (.02)	.02 (.02)	.02 (.02)
Centered R^2 (Centered R^2)		.91 (.99)		
R^2 (Adjusted R^2)			.92 (.89)	.92
$F_{k,n-k-1}$		$F_{25,113}$ = 47.04 (p = .00)	$F_{25,113}$ = 48.82 (p = .00)	$F_{25,113}$ =97.62 (p = .00)
Test of endogeneity (H_0: Attendance is exogenous)	Wu-Hausman F test	$F_{1,112}$ = .58 (p = .45)		
	Durbin-Wu-Hausman chi-sq test	χ^2 (1) = .72 (p = .39)		
Test of omitted variable (H_0: Model has no omitted variable)	Ramsey RESET test		$F_{3,110}$ = .86 (p = .47)	
Test of heteroscedasticity (H_0: Constant variance)	Breusch-Pagan / Cook-Weisberg test		χ^2 (1) = 3.57 (p = .06)	
	White's Test		χ^2 (138) = 139 (p = .46)	

The third column in Table 1 presents the Ordinary Least Squares (OLS) estimators. The diagnostic tests show that though the model does not suffer from the omitted variable bias, it does suffer from heteroscedasticity. Furthermore, the mean VIF is 2.58, and none of the individual VIF is as large as 10, i.e., a high correlation is not present here. The only problem here is heteroscedasticity.

Thence we estimate the model with heteroscedasticity-adjusted robust standard errors, as reported in column 4 of Table 1. These are our final results which will be interpreted. According to the diagnostics, the model's overall predictive power is significant and explains around 92% of the variations in student performance.

First, we look at the 'ability' variables. Past performance, score in English in the admission test, if studied economics at the pre-university level, if s/he was a student of the science group at higher secondary (the benchmark category is the arts group) – all exert positive impacts significant at less than 1% level of significance, on the performance of the student. The effect of GPA in higher secondary is also positive but significant at a 5% level. A student's commerce background fails to register any significant difference from the base category.

Among the variables representing 'effort and motivation,' the CGPA of the student's best friend exerts a positive influence that is significant at a 1% level. The impact of the number of retakes is negative, linear, and statistically significant. Study time is also a positive determinant, though significant only at the 10%. Scholarship, time spent on social media, and group study turn out to be insignificant determinants. The University has a mandatory attendance policy, and attendance plays no vital role in enhancing student performance.

Of the other characteristics, age, gender, and religion are unimportant determinants. However, if the student is from the local district, their performance is better (significant at 10% level). This finding may be because local students stay with their families and are under a higher degree of monitoring by the family or guardians. Among the household attributes, father's and mother's education do not significantly affect performance. However, the level of household income is an important determinant of performance.

Student's 'ability' increases the predictive power of the model significantly. The corresponding F statistic is $F_{6,113} = 49.20$ with a p-value = .00. The variables representing student's 'effort and motivation', when taken together, also increases the overall significance of the model appreciably ($F_{8,113} = 3.09$ with a p-value = .00). Similar inferences can be drawn for the household attributes ($F_{7,113} = 2.31$, p-value = .03).

Discussion

To find the determinants of students' academic performance, we estimate a multivariate regression model. Our data did not support an IV-2SLS model. Hence, we estimated the model using the OLS approach and calculated the robust standard errors.

As a group, the 'ability' variables affect student performance significantly. Except for one, all the variables in this group are individually significant. If past performance increases by 1 unit, on average, and holding all else equal, student performance increases by .62 units. So, on average, students who performed better in the past perform better today. Similarly, if a student's GPA in the Higher Secondary is raised by 1 unit, their academic performance in a semester at the university level increases by .13 units. All the coefficients can be interpreted similarly. In a typical economic course, all the reading materials are in English, a foreign language. Our evidence suggests that students' English proficiency affects their academic performance positively. Students come to study economics from different educational backgrounds. If we look into that, we find that if someone has studied economics at the pre-university level, it affects their performance positively and significantly. Many economics courses are mathematical. Students with a good mathematical background are likely to do better in economics. Our study supports this. Students who studied in the Science group (the most mathematics-oriented group) in the Higher Secondary, compared to students who studied Arts (the least mathematics-oriented group), perform significantly better. However, studying Commerce in the Higher Secondary has no important impact on performance.

Efforts and motivation are also significant determinants of performance. However, only three variables in this group are significant. The most important is the peer effect. A best friend's performance affects a student's performance positively and significantly. Time spent studying also exerts a significant favorable influence on performance. Another determinant is the number of retakes which generates a significant negative impact. This is expected because a student needs to study more subjects and sit for more exams in a semester with retakes. Often, it is assumed that as the number of retakes increases, performance falls at a higher rate, i.e., the impact of the number of retakes is nonlinear. To capture this, we also included 'number of retakes squared' in our model. The findings suggest that such a nonlinear impact is absent here. Other variables like scholarship, time spent in social media, and group study are not important determinants of performance. Among the other student attributes, only one is important. A local student does better than someone from outside the district.

Household attributes are also important determinants of student performance. Individually, three of the income category dummies exert significant positive influence when compared to the base category. For income categories II, III, and IV, the impact on performance is positive and significant, compared to income category I. However, being in income categories V and VI does not increase performance significantly compared to the reference income category. This implies that higher household income is an essential determinant of performance up to a certain level. Once that level is reached, income fails to improve performance further.

Our results show that attendance does not improve academic performance. This is in contrast to Romer (1993), Durden and Ellis (1995), Devadoss and Foltz (1996), Dolton et al. (2003), Kirby and McElroy (2003), Cohn and Johnson (2006), Stanca (2006), and Arulampalam et al. (2012) that found that attendance influences student performance positively and significantly. The University's mandatory attendance policy might have played a role here.

Similar to Devadoss and Foltz (1996), we found motivation as an important determinant. Park and Kerr (1990) and Durden and Ellis (1995) confirm our findings that GPA and entrance exam scores are important determinants of achievements in economics courses. Prior GPA was also a strong and positive factor in Martin (1989), Devadoss and Foltz (1996), and Borde et al. (1998). Also, consistent with Brasfield et al. (1992) and Durden and Ellis (1995), who found that previous exposure to calculus affects performance positively, students from the science group, the group with the highest number of mathematical courses, perform better. Our results are consistent with Myatt and Waddell (1990), Brasfield et al. (1993), Durden and Ellis (1995), who reported previous economics courses improving performance and thus contradict the findings of Siegfried and Fels (1979) and Kirby and McElroy (2003).

We diverge from Durden and Ellis (1995), as the impacts of father's and mother's education are insignificant in our study. Like Borde et al. (1998), age has no remarkable effect on performance. Gender plays no role in performance, a finding consistent with Williams et al. (1992), Durden and Ellis (1995), Kirby and McElroy (2003), Cohn and Johnson (2006), and Stinebrickner and Stinebrickner (2007), but contrary to Siegfried (1979), Lumsden and Scott (1987), and Borde et al. (1998). Cohn and Johnson (2006) found no significant impact of 'if the student attempted the class before.' In our paper, the number of retakes played an important role. We provide strong evidence that peer effects matter, similar to Stinebrickner and Stinebrickner (2007). Similar to Dolton et al. (2003) and Stinebrickner and Stinebrickner (2007), a student's study time positively impacts performance in our study.

Conclusion

There is a gap in the literature as no study systematically explored the determinants of Bangladeshi university students' academic performance. In this paper, we estimate an econometric model to investigate how student attributes such as ability, effort and motivation, and household attributes impact the academic performance of undergraduate economics students.

We use past performance at the university level, higher secondary level GPA, English proficiency, pre-university economics courses, and if studied in the arts/commerce/science group at the higher secondary level as proxies for ability. To measure the level of effort and motivation, we use attendance, daily study time, number of retakes, if receiving any scholarship, daily time spent on social media, if the student studies in a group, and the best friend's performance. Apart from these traits, other student characteristics considered include age, gender, religion, and the student from the local district. Household characteristics included in the paper are the father's education, the mother's education, and family income.

Because of the potential endogeneity of attendance, we use the Instrumental Variable Two-Stage Least Squares (IV-2SLS) regression technique to estimate the model. We use 'if the student lives on campus' and 'if s/he faced any problem including health and family issues in the previous semester' as the instruments for attendance. The test of endogeneity, followed by the 2SLS estimates, reveals that attendance is exogenous, and hence OLS is the justified method.

The paper's findings indicate that a student's ability, effort and motivation, and household attributes individually explain significant variation in university economics students' performance in semester final examinations. Among the ability variables, performance in previous semesters, higher secondary performance, English proficiency, having studied economics at the pre-university level, and having a science background come out as important determinants. Among the 'effort and motivation' variables, daily study time, the number of courses retaken, and the best friend's performance matter significantly. Students with higher household incomes tend to perform better up to a certain level. Also, students from the local district tend to outperform others. With a mandatory attendance policy, which makes a minimum percentage of attendance binding, attendance fails to register any substantial impact.

A limitation of our study is that due to data inaccessibility, we could not control for department-level or university-level characteristics. Such an analysis requires data from the country's different economics departments or different universities. Nevertheless, this research paves the way for further research in this area.

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Teaching nation-building and nationalism: a critical perspective of Turkish academia

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Abstract

The process of nation-building can be seen as a never-ending attempt for a considerable number of nation-states. Education has been one of the primary tools in this process. It can be argued that nation-building policies should be seen as aspects of an attempt rather than a project that can be realized successfully in all terms. Following this argument, this study has two main objectives: to draw a detailed literature review addressing the dynamics, actors and stages of the nation-building process and nationalism and to critically analyze how Turkish academia has dealt with nationalism education. This study will proceed via the following sections: Firstly, the main theoretical discussions concerning nationalism will be covered. In this regard, ethnic/civic nationalism and other types of nationalism, including the concept of "banal nationalism" coined by Michael Billig (1995) will be under scrutiny. Secondly, the state-formation process from a cultural viewpoint will be analyzed. In this part, the works of thinkers such as Pierre Bourdieu, Michel Foucault and Antonio Gramsci will be referred to. Next, 'the nation-building process as a never-ending attempt' will be addressed. Finally, the teaching of nationalism in Turkish academia will be discussed from a historical viewpoint.

Introduction

The process of nation-building can be seen as a never-ending attempt for a considerable number of nation-states. This study argues that nation-building policies should be seen as aspects of an attempt rather than a project. Civil wars, internal conflicts, micro-nationalist movements, separatist nationalist movements and some terrorist organizations can be seen as examples that show that nation-building for many states can never be a completely-achieved project.

For Eric Hobsbawm (1990) nations and nationalism are products of social engineering. In this sense, social engineering can be seen as a dynamic process rather than a project that has a determined time period to carry out. The unity within the state cannot remain purely administrative because the coordination of activities requires cultural homogeneity. In this regard, education is very important in providing cultural homogeneity.

This study adopts the argument that national education policies are among the factors which pave the way for the reproduction of the dominant ideology. Therefore, this study recommends that there is a need for the redesign of the pedagogical framework of the teaching of nationalism in order to eliminate social inequalities inherent in society. In this context, Freire's (1970) *The pedagogy of the oppressed* is one of the critical references cited in this study.

This study has two main purposes: the first purpose is to draw a detailed literature review[1] of the nation-building process and nationalism and the second one is to critically analyze how Turkish academia has dealt with nationalism and nation-building education from a historical perspective. The main research question of this study is as follows: From a historical viewpoint, what kind of changes has Turkish academia undergone in terms of nationalism education? In this research question, the notions of nation-building along with nationalism are significant as education has been used as a tool in the early years of the Turkish Republic to indoctrinate the masses. In order to properly understand how Turkish academia has addressed nationalism education from a historical perspective, this study provides a thorough literature review of nationalism theories and nation-building.

The research design of the study applies a qualitative methodological framework and adopts qualitative data collection using primary resources such as constitutions and various secondary resources like books and journal articles. The data of the study are holistic and rich rather than relying on a single data type such as history books.

Based on the above-mentioned research question, this study will first provide the main theoretical discussions concerning nationalism and the state-formation process from a cultural viewpoint. Nationalism as an ideology can be defined as a set of views that underlines the premise that the individual's loyalty to the nation-state surpasses other individual or group interests. Özkırımlı (2005) defined nationalism as a particular way of interpreting the world. In a similar vein, nation-building can be defined as a process whereby the inhabitants of a state's territory come to be loyal citizens of the state (Bloom, 1990).

In the theoretical framework part, the works of thinkers such as Pierre Bourdieu, Michel Foucault and Antonio Gramsci will be cited. This study will provide a thorough analytical framework based on the literature addressing nationalism, state-formation from a cultural perspective and the nation-building process in addition to addressing how Turkish academia has approached nationalism education.

Theoretical approaches to nationalism

There is no single theory to explain the social phenomena of nations and nationalism. A nation can be seen as a particular way of thinking of what it means to be a people, and how this definition of people might fit into a broader world system (Calhoun, 1997). According to Özkırımlı, nationalism is a particular way of interpreting the world, a frame of reference that helps us make sense of the reality that surrounds us (Özkırımlı, 2005). Following Özkırımlı's approach to nationalism, the main focus of this study stresses the importance of nationalism education in building national identity.

Nationalism can be seen as an ideology produced by the resentment of new elites against older elites or opposing countries. Elites can find challenges which mobilize national sentiments and feelings. In this regard, it can be said that nationalism also gives human beings a sense of belonging, offers rescue from alienation and assures individuals they have the right to equal status (Greenfeld, 1992). As a reflection of taking nationalism as a motivation through which national sentiments are mobilized, nationalism education policies in this context play a key role in offering people a sense of identity and belonging.

Ernest Renan stated that nationalism can be seen as a solidarity sustained by a distinctive historical consciousness and defined nationalism as a "daily plebiscite". In the circumstances of late nineteenth century France, Renan drew attention to the importance of the tensions masked in nationalist sentiments. Renan ([1882] 1990) argued that while it was true that acts of violence like ethnic cleansing helped to form the nation, it was also necessary for ordinary people to leave them behind and take the nation as given and not violently created.

On the other hand, it is known that categorizing different types of nationalisms has long been a scholarly endeavor. Meinecke's work *Cosmopolitanism and the National State* was one of the earliest attempts. Meinecke ([1907] 1970) divided nations into distinct groups as political nations (Staatsnationen) and cultural nations (Kulturnationen). The former are often linguistically defined and ethnically based. In theoretical works, the German Kulturnation appears mostly as an antithesis to the French concept of a Staatsnation (Wodak et al., 2009). In a similar vein, Kohn (1944) was among the first to elaborate on the distinction

1 The literature review section addressing nationalism theories, state formation from a cultural perspective and nation-building process is based on the author's PhD dissertation titled The image of the undesired citizens in Turkey: A comparative critical discourse analysis of the Hurriyet and Zaman newspapers which has been published as a book.

between Western and Eastern forms of nationalism. In France, England and America, according to Kohn, the nation was regarded as a rational association of common laws; by contrast, an authoritarian nationalism in Central and Eastern Europe emerged. Accordingly, the ethnic form of nationalism is based on descent, race and kinship. In addition, vernacular culture, especially customs and language are key elements of an ethnic nation (Smith, 1991). This form of nationalism is referred to as the German model and is defined by ancestry, not by boundaries of a state. It is a community of birth and native culture where common descent is heavily emphasized. By contrast, in the Western or civic model of nationalism, national unity arises from a historic territory and laws and the legal-political equality of members which is underpinned by a set of rights and duties. Smith (1991) argued that every type of nationalism contains civic and ethnic elements in varying degrees and different forms.

One of the biggest issues in nationalism literature is the divide between 'constructivists' or 'modernists' and 'primordialists'. Geertz is often considered to be the scholar who introduced the primordial sentiments concept of an individual to the world. According to Geertz (1963), primordial attachments stem from the 'givens'. Primordial attachments are natural rather than sociological. Primordialism is not a single theory, but rather an umbrella term which consists of a number of theories. Modernism is not a homogenous tradition either. The common denominator in modernist theories is that, unlike primordialists, they assert that nations are modern phenomena. The modernists emphasize the historical and sociological processes by which nations are created. The modernist scholars see nationalism rooted in industrialization (Gellner, 1983), the rise of communications media (Anderson, 1983), the development of the modern bureaucratic state (Breuilly, 1982) and regard it as an invention (Hobsbawm, 1990). This study adopts a modernist approach to nationalism. In other words, it can be said that national education is a part of the processes by which nations are constructed.

Nations constitute "dual phenomena, constructed essentially from above, but which cannot be understood unless also analyzed from below, that is in terms of the assumptions, hopes, needs, longings and interests of ordinary people" (Hobsbawm, 1990, p. 10). Hobsbawm highlighted the role of political transformations in understanding nationalism and defined it is an "invented" phenomenon. For Hobsbawm, nations and nationalism are products of social engineering. In the era of nationalism, it became tantamount to the enforced maximization of religious, ethnic and economic homogeneity by any means (Quine, 2013).

Michael Billig (1995) challenged the orthodox conceptualizations of nationalism which tend to focus only on its extreme manifestations. Billig introduced the term "banal nationalism" to cover beliefs, ideological habits, representations and unnoticed, routine practices which make the daily reproduction of nations in the West possible (Yumul & Özkırımlı, 2000). These practices are not removed from everyday life, as some observers have previously suggested. Furthermore, Billig questioned why people do not forget their national identity. For Billig, nationalism is constantly flagged in the media through symbols and it is important to recognize the signs of nationalism which are so familiar that they are easily overlooked.

State formation from a cultural point of view

The traditional state-building approach stresses the establishment or strengthening of state institutions and political systems. The perspective which underlines the political-military dimensions of state formation presents the modern state as a military, political, and economic accomplishment. However, it tends to obscure the fact that the modern state is also a symbolic accomplishment (Bourdieu, 1994).

According to Bourdieu, the state has both a monopoly of physical power and symbolic violence. Symbolic power according to Bourdieu is a hidden structure of power which is applied when coercive power cannot be exercised. Bourdieu (1994) defined the modern state as an institution which successfully claims the monopoly of the legitimate use of physical and symbolic violence over a definite territory and population. Bourdieu highlighted the state's power of naming, authority and processes of delegation through acts of state. He also enriched the study of nation-states by elucidating the role of symbolic violence in addition to the legitimate use of force by expanding Max Weber's classical definition to emphasize both symbolic and physical violence.

Drawing on Max Weber's definition of the state (1978) as a compulsory political organization that holds the monopoly of the legitimate use of violence within its territory, it may be plausible to suggest that works on the rise of modern nation-states have focused on the political-military dimensions of state formation. Norbert Elias critically took up Weber's core definition and conceptualized European state formation as a 'civilizing process'. Elias (1994) provided significant clues in exploring how the nation-states shape the identity of the citizens along with state ideals. In the theory of the civilizing process, Elias put together the macro-sociological aspects of state formation and the micro-sociological consequences of this process; the ways in which the evolution of the modern state has shaped social practices.

Another writer who moved beyond the materialist conceptions of the state is Patrick Carroll. Carroll studied the use of modern scientific knowledge by British agents in their colonization of Ireland and according to Carroll (2006, p. 2), "states are made of knowledge, just as knowledge is constituted by states". Carroll developed a concept of culture which includes the interrelated parts of discourse (like symbolic meaning) practice (organized social activities) and materiality (constructed environments).

Another thinker whose studies can be used as an analytical toolkit in understanding the immaterial conceptions of the state is Antonio Gramsci. Gramsci's notion of hegemony is significant as this notion highlights the importance of consent besides coercion while illustrating how state power can be exercised in a stable manner. The theory of hegemony is based on a simple principle: modern man is not ruled by force alone, but also by ideas (Bates, 1975). Physical domination cannot be enough; there is a need for

spiritual supremacy as well. Those who obey must, to some degree, share the values and standards of their superiors and consent to their own subordination. For the ruling elites, the notion of consent is important as they cannot provide and reproduce the dominant ideology among the masses solely via coercion-based measures. Thus hegemony plays a key role in the efficient management of a society, and state schooling plays a key role in the construction of hegemony.

The other thinker whose studies can be used in understanding the immaterial conceptions of the state is Michelle Foucault. Foucault's (1991) notion of "governmentality" that sees the state as an apparatus encouraging populations to be socially and economically productive is another critical term in analyzing states from a cultural perspective. In addition, Foucault's conceptualization of power is useful in studying the power of the modern nation-state in relation to her surveillance of the citizens. For Foucault (1982) it is not a good idea to consider the modern state as an entity which was developed above individuals, ignoring what they are and even their very existence. Foucault coined the term 'bio-power' to refer to a form of power, which initially emerged in the seventeenth century. Foucault wrote that (1981, p. 143), "bio-power brought life and its mechanisms into the realm of explicit calculations and made knowledge/power an agent of transformation of human life". Modern bio-power rests upon techniques of power embedded within the daily practices of social institutions such as schools or prisons. Foucault's conception of the state can be seen as an entity which is something constantly produced and reproduced by practices of government, administration and acclamation. In such a conception of the state, schools have a critical function in enhancing "governmentality".

Within the framework of the immaterial conceptions of the state, nation-building is one of the primary tools through which the idea of the nation is created and reproduced. Nation-building is realized through several instruments and a national education system is one of the important aspects of these tools. The goals that ruling elites pursue during nation-building, such as homogenization and creating a common identity, are made possible through state initiatives such as state schooling.

The dynamics of the nation-building process

The nation-building process can be seen as a never-ending attempt rather than a project that can be fulfilled completely. It can be seen as a dynamic process. The term 'nation-building' is a process which evokes a common identity in order to form unity within the state. Nation-building describes the process whereby the inhabitants of a state's territory come to be loyal citizens of the state (Bloom, 1990). The homogenization policies led by the state elites during nation-building play a key role in the nation-building process. Homogenization can be defined as the sociopolitical process of fostering cultural homogeneity. This is directed by elites who often engage in social engineering. In this context, homogenization can be viewed as an elite-driven attempt to impose socio-cultural changes which eventually lead to the achievement of cultural uniformity (Conversi, 2007).

Central to the homogenizing policies carried out during nation-building is the creation of a national history. Establishing a common past for a large community requires a degree of social consensus on historical experience. This consensus has been pursued through national history writing and national education. Poggi (1978) related the expression of geographic, linguistic, cultural and ethnic distinctiveness of a community to the attempts of national unification. According to Hutchinson (2006) one of the institutions through which national unification is sought is mass conscription. In addition to mass conscription, state schooling is also important in the nation-building process. Compulsory education plays a decisive role in developing uniformity among citizens, which is a fundamental aspect in nation-building.

On the other hand, considered purely in terms of the state's coercive capacity, there are different strategies to homogenization such as forced assimilation, expulsion and extermination. However, homogenization is not always implemented through violent methods but also through quieter migrations of ethnic groups (Brubaker & Laitin, 1998). According to Mylonas (2013), there is a categorical conceptualization of nation-building which posits three possible state policies like accommodation, assimilation or exclusion. The elites can pursue cultural, occupational, educational, demographic, political, and other state policies to push the non-core group into adopting the core group's culture. This is known as assimilation (Mylonas, 2013), with the ultimate goal of integration. These policies differ from group specific plans because they do not target particular groups, but may disproportionately affect a specific group (or part of a specific group). According to Mylonas (2013), assimilationist policies seek to secure the loyalty of an individual or a community and can be either violent or non-violent. Alternatively, the elites can retain the non-core group in the state, but grant the group special minority rights. Certain differences of the non-core group are respected, and institutions which regulate and perpetuate these differences are put in place. This is called accommodation.

In summary, nation-building involves attempts to reconfigure collective identities by adjusting national priorities and morals, as well as through attempts to sentimentalize or even de-sentimentalize these concepts within the national consciousness (Norman, 2006). Linguistic and ethnic standardization, citizenship policies, compulsory education, mass media and mass conscription are the primary tools employed by elites during nation-building.

The teaching of nationalism in Turkish academia

According to Althussser (1971), schools are among the ideological state apparatuses through which state ideology is reproduced. The institutions such as schools, the churches, and the media serve to transmit the values of the state. In the Turkish context, national history has been one of the important tools in reproducing the idea of a Turkish national identity. Seeds of nationalism in Turkey have been sown through history textbooks and national education.

This section of the study is an attempt to critically analyze

the Turkish perspective of nationalism studies from a historical viewpoint. Before the establishment of modern Turkey in 1923, the education system had been based on a non-secular framework in the Ottoman times. The establishment of the Republican regime brought a radical system change in teaching and the educational field. The principles of secularism and Kemalism as the core state ideology have been two critical factors shaping both Turkish national identity and Turkish academic structure especially in the early years of the Republic.

Figure 1: National schools were opened in 1928 (Bekar, 2020).

Figure 2: Atatürk and his adopted daughter Afetİnan, one of the first Turkish female history professors and ideologues of the Turkish Historical Thesis (https://isteataturk.com/g/icerik/Afet-Inan-a-Yazdigi-Mektup-16011937/773).

Nationalism education in the early Republican era

The single-party years between 1923 and 1950 are known as the period of the early Republican era. In these years, the Kemalist nation-builders had been engaged in producing a national Turkish citizenship regime along with building a national identity. In this context, nationalism education and research focusing on nationalism studies were used as primary instruments to legitimize and reproduce the Kemalist state policies. Through history textbooks and national education, the aim of making the masses internalize the newly-established regime had been pursued by Mustafa Kemal Atatürk and his associates.

Following the proclamation of the Republic, Atatürk started a series of revolutions in order to make the Turkish society a secular and developed nation. A radical change was made in fields like economy, education, and law. The ideology of nationalism provided the required basis for Kemalist revolutions in all fields (Dönmezer, 1983). The field of history has been among the most important elements that build the cultural roots of a nation. A modern Turkey could only be established through national consciousness. Thus, the teaching of nationalism had played a key role in constituting this consciousness.

Eugene Weber (1976) argued that the patriotic feelings had to be learned in France, and this can also be relevant for other contexts in the making of nation-states. In the Turkish case, the Kemalist elites used national education as a tool to build a common national character. In addition to formal school system, Millet Mektepleri (National Schools) and Halk Evleri (People's Houses) were founded (Ersanlı, 1996). People's House's publication YeniTürk Mecmuası (New Turk Magazine) was one of the important publications promoting national ideals and values (Tütüncü, 2007).

One of the most important developments in nationalism education had been the establishment of the Turkish Historical Society in 1932 with the aim to conduct historical studies. The view which noted that Turks had spread their ancient cultures serving for other civilizations during their migration from Central Asia was promoted through the Turkish Historical Thesis (Zürcher, 2004).

The main objective of national education during this period was to raise a generation with commitment to the Turkish Republican ideals. In these years, the textbooks titled *History in the Republic* by İhsan Şerif Saru and *National History* by Fuat Köprülü were prepared for the 5th grade students (Ata, 1998). After 1925, following the suggestion of the Turkish Historical Thesis, new arrangements were made for primary and secondary schools. In these years, a two-volume book titled *Medeni Bilgiler* (Civic Knowledge) prepared by Afet İnan was published with the aim to disseminate the idea of a 'good citizen'. In parallel, the lectures on the history of the revolution given by Recep Peker, Mahmut Esat Bozkurt and Yusuf Hikmet Baydur were significant parts of the teaching of nationalism (Tütüncü, 2007).

It can be said that the education policies of this era had a progressivist and secular mentality. In addition to the above-mentioned mentality, Turkish nationalism education had an ethnicist and even racist character. Nazan Maksudyan's work titled *Türkçülüğü Ölçmek: Bilim kurgusal Antropoloji ve Türk Milliyetçiliğinin Irkçı Cehresi [Measuring Turkishness: Science fiction anthropology and Turkish nationalism's racist aspect]* (1925-1939) reveals this character.

Another work focusing on the official history approach of the Republican regime is Büşra Ersanlı's work. Ersanlı's work titled *İktidar ve Tarih: Türkiye'de 'ResmiTarih' Tezinin Oluşumu [Power and history: The constitution of the official history thesis in Turkey]* (1929-1937) focuses on the relationship between power and history writing. This work notes that the Kemalist elites tried to homogenize the masses through resorting to the historical origins of Turks. In addition to Ersanlı's work, Füsun Üstel (2004) in her detailed research, titled *Makbul Vatandaşın Peşinde: II. Meşrutiyet'ten Bugüne Vatandaşlık Eğitimi [In pursuit of the acceptable citizen]*, analyzes the formation of the 'desired citizen' through the citizenship textbooks.

After the death of Atatürk, İsmet İnönü was elected as the new president. Under İnönü's rule, Arabic works and languages were banished and Western works were promoted (Şeker, 2000, p. 13). The first Educational Council was held in 1939 and the second Educational Council was held in 1943 to discuss the newly-established history courses. In this period, a report was presented to the Presidency of the Council regarding this issue. The report underlined the necessity of planning a new programme. Following this, the history textbooks of high schools were revised based on a secular and Western outlook (Köken, 2002). Humanism was adopted in the preparation of textbooks in the 1940s (Şimşek, 2013). Another feature of the education during the İnönü period was the peak seen in military practices. Military lessons and physical training were taken much more seriously and expanded to almost all education levels.

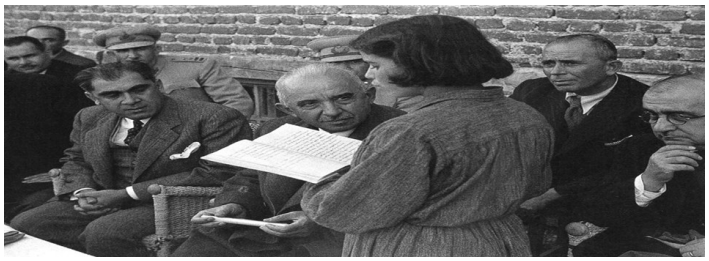

Figure 3: İsmet İnönü's visit to Village Institutes (Güneri, 2004).

Nationalism education during the Democrat Party rule (1950-1960)

Turkey transitioned to a multi-party system in 1946 and Democrat Party (DP) under Adnan Menderes leadership came to power in 1950. However, the change in education policies in a multi-party period was shaped by some earlier developments. One of them had been the Fourth Congress on Education which was organized in 1948. After this congress, education started to be handled with a more inclusionary approach. For instance, the Turkish History Thesis which had an ethnicist character was criticized. The Democrat Party (DP) came into power in 1950. The DP under the leadership of Adnan Menderes had a different perspective in terms of culture, education, economics and the relationship between state and religion (Eroğul, 1970). In terms of the policies of education, the introduction of religious education at primary schools, the reopening of the Imam Hatip schools[2] (secondary education institutions that train government-employed imams), and the closure of Village Institutes were among the primary policies that were implemented.

In the DP era, radical changes were made in history education. In these years, the interest in the Ottoman and Islamic history was empowered. During the ten-year period in which Menderes was in power, five governments were formed in the Grand National Assembly. All government programmes were based on the principles of the party programme. The principles in the programmes emphasized commitment to national, spiritual and traditional values. The nationalism education in these years had been influenced by religion and cultural values in a more concrete way as compared to previous years. For example, famous historian Fuat Köprülü had an important influence on the nationalism education during the DP period. Fuat Köprülü was among the founding members of the DP. Köprülü had many criticisms against the Turkish History Thesis which was theorized by Atatürk. According to him, the arguments of the Thesis had not been based on scientific principles.

The transition to a multi-party system led to significant changes in the field of education. Important reforms such as the opening of new universities were undertaken. Four new universities were founded in this era. The share allocated to education from the general budget in the 1940s was around 6–7%. In 1960, when the Menderes government was overthrown by a military coup, this rate had been doubled and had risen to over 13% (Karakök, 2011, p. 97).

Figure 4: A view of Middle East Technical University in Ankara in the years of its foundation (Sakaoğlu, 2003).

Nationalism education during the military regimes (1960-1980)

The military coup of May 27, 1960 had a major impact on Turkey. The fall of the Menderes government and the rule of the military regime which continued until 1963 had led to significant changes in Turkish political life. These changes shaped education policies as well. The 1961 Constitution had addressed higher education in a wider scope. In addition, the courses and textbooks were revised. In this period, migration from the village to the big cities accelerated and the demand for education increased. As a result, the insufficient supply started to become a barrier to access to education.

An important development seen in educational field after the 1960 coup was the opening of Maarif Colleges. The Maarif Colleges had gained importance in early 1960s. The opening of Maarif Colleges which was made possible with the effect of developing relations with United States was followed by the arrival of the "American Peace Volunteers" in Turkey to work in the field of education with an agreement signed in 1962 (Gündüz & Erdemir, 2021).

With regards to the changes in curricula, in the years following the 1960 coup, elective religion courses were included in the curriculum. In order to spread and promote the spirit of May 27, a textbook titled *May 27* in schools was published. Nationalism education in these years promoted the idea of national and territorial integrity of the Turkish

2 İmam Hatip Schools are secondary education institutions ('hatip' coming from Arabic khatib). Since their creation in the 1950s, Imam Hatip schools have been controversial in the debate about Turkey's secularism.

Republic through not only textbooks but also through legal arrangements. The 1961 and 1982 Constitutions had a major impact on education policies. The military coups in 1960 and 1980 caused the militarization of state administration and coalition governments ruled the country. The instability in politics has also shown itself in education. It can be said that the best example of this is the frequent change of the ministers of national education.

Nationalism education in the post-1980 period (1980-2002)

The September 12, 1980 military coup had a major impact on Turkey's political, administrative and economic life. The military regime continued until 1983. In addition to restructuring Turkish politics, it also caused the militarization of social and educational fields. The military tutelage showed itself as national security courses which started to be taught (Öztürk, 2009). In 1982, a new constitution was drafted. New regulations were enacted in higher education after the coup. The most critical one was the Law No 2547 which established the Council of Higher Education (YÖK). This law put a heavy emphasis on Kemalist nationalism in higher education. According to Hesapçıoğlu (2009), Higher Education Law No. 2547 that was enacted after the 1980 coup replaced a French influence in education by an American influence. It is also to be noted that, raising young generations as individuals who are sensitive to the values of common history and a culture based on Atatürk's principles and reforms had been the primary goal of nationalism education in these years.

In the aftermath of the 1980 military coup, new regulations were enacted in teacher education, religious courses and the content of textbooks were revised. In textbooks, the notion of Turkey's 'internal enemies' was used as a tool to construct enemies that challenge the unity and the principles of national ideology and to enhance the idea of national belonging (Altınay, 2004). After the 1980 coup, compulsory religious education was introduced. The 1982 Constitution obliged all schoolchildren, from the fourth grade until graduation from high school, to take the 'Religious Culture and Ethics Knowledge' courses (Burak, 2015).

After 1980, in a similar fashion to Thatcher in the U.K. and Reagan in the U.S., Turgut Özal's rule in Turkey had paved the way for economic and political liberalization. The neo-liberal economic policies not only shaped the public affairs but also shaped the content and management of education So a critical development in educational policies after 1980 was liberalization. The increase in the number of private schools can be seen as a sign of this development, however, this increase had not brought a radical change in the objective of national education. The objective of national education has stayed the same: promoting national ideology.

On the other hand, the 1990s witnessed the rise of political Islam in Turkey under the leadership of the Welfare Party. This rise alarmed the secularist actors among which the army had been the most powerful one in these years. In 1997, a military intervention known as the "post-modern coup" happened. On 28 February 1997, the National Security Council (NSC) held the longest meeting in its history to propose an ultimatum to the Welfare Party. The government was presented with a list of anti-Islamist measures, ranging from bans on private Quran courses to curbs on the donation of sacrificial animal hides to religious organizations. At the top of the list was the demand for the extension of compulsory education to eight years. This clearly aimed at removing the intermediate sections of the İmam Hatip schools. In these years, Islam's social and economic bases as well as its political actors were very much targeted (Burak, 2010). Apart from that, in 1999, Turkey gained the status of official candidacy for European Union. In line with this, in the late 1990s, many students were sent to European countries for education.

Nationalism education during the Justice and Development Party rule (2002-2021)

Recep Tayyip Erdoğan's Justice and Development Party (JDP) came to power after the 2002 general elections. Since 2002, Turkey has been ruled by the single- party rule of the JDP. In the 2000s, the Turkish education system has undergone a significant change in terms of the philosophical foundations on which it is based. In this process which started to be implemented in primary education in 2005 and in secondary education in 2007, a constructivist approach was preferred. The constructivist approach puts the student in the centre instead of the teacher (Yazıcı & Şimşek, 2012).

One of the most important structural changes brought about by the 2007 history curriculum is the abolition of courses such as General Turkish History, Islamic History and Ottoman History that had been started to be taught with the 1993 curriculum. Instead, the 'History of Revolution and Kemalism course' and the 'Contemporary Turkish and World History' course in the 12th grade were added to the curriculum in 2008.

Another important development in education during the JDP rule was the abolition of "Andımız" (Our Oath). In 2013, Turkey's Council of State, the highest administrative court in the country declared that the recitation of the oath will no longer be part of the daily routine for Turkish students. The oath was saying the following (Bayar, 2021):

> I am a Turk, I am honest, I am hardworking. My tenet is to protect the young, respect my elders, to love my country and my nation more than my own self. My goal is to improve and to advance. O great Atatürk! I swear to walk incessantly on the path that you have paved towards the goals you have set. May my existence be dedicated to the Turkish existence. Happy is the one who says 'I am a Turk'.

According to some Kemalists, the discontinuation of this oath was a sign of abandoning the Kemalist understanding of nationalist ideology. In these years, an ultra-conservative and nationalistic approach was adopted. The JDP embodied its conservatism with both a national and security-oriented approach. The developments in that period (such as the Arab Spring, the Gezi Park events, the presidential election in 2014) paved the way for the adoption of a new approach.

JDP rule paved the way for important changes such as extending the duration of compulsory education to 12 years. In these years, two different phases were existent. The first phase between 2002 and 2011 which was defined by the introduction of neoliberal policies had continuity with the past education policies and the principles that determined them. The second phase covering the last decade witnessed more complex and major changes through which all educational structures were influenced by religious and conservative policies (Durakbaşa & Karapehlivan, 2018). The efforts to increase religious themes in education and de-secularization attempts by marginalizing pedagogy with Kemalist symbols, adding Islamic celebrations to the academic year programmes, and ending republican celebrations such as May 19 Youth and Sports Day became visible along with gender-based discrimination. These changes were regulated by a series of administrative instructions, regulations, decrees and laws (Kandiyoti & Emanet, 2017).

Another significant step taken in order to strengthen cultural values and Islamic moral values in education was the start of "Values Education" (Değerler Eğitimi). Türkmen (2009) in his study focusing on the changes made in the curriculum of the courses on Religious Culture and Moral Knowledge between 1995 and 2007–08 notes that the new content of these courses has been designed to impose religion in a neoliberal fashion.

On the other hand, a critical development that had important impacts on many fields like administration and education has been the military coup attempt of 2016. The military coup attempt of July 15, 2016 was followed by a state of emergency in the country. During this period, the Ministry of National Education announced a new draft curriculum presenting new courses at the primary, lower secondary, and upper secondary school levels. The changes made in the curriculum included removing important historical events and founders of the republic (e.g. Atatürk and İsmet İnönü) and replacing them with Islamized ones promoting Muslim scientists, and increasing the religious content in the textbooks. Kandiyoti and Emanet (2017) argue that the rhetoric of *The July 15 victory of democracy* has been represented as 'the foundational event' of the New Turkey. In short, it can be said that the JDP rule especially in recent years has injected a considerable degree of moral and religious themes into education while undermining the Kemalist nationalist ideology.

Conclusion

The nation-building process can be seen as a never-ending attempt. It can be argued that nation-building policies should be seen as aspects of an attempt rather than a project. Education has been one of the critical instruments in this process. Through mass education, state elites reproduce dominant ideology. Nationalism can broadly be defined as a particular way of interpreting the world and different contexts have different types of nationalisms. Mass education and national history writing have been primary tools in the nation-building process. Through these two primary tools, elites attempt to homogenize the masses and create a national identity.

Nation-building and state formation cannot be regarded as material processes that only include military and administrative features. In fact, these processes also include immaterial characteristics and cultural homogenization constitutes a critical part of these characteristics. Homogenization is the sociopolitical process of fostering cultural homogeneity. Homogenization can be viewed as an elite-driven attempt to impose socio-cultural changes which eventually lead to achieve cultural uniformity (Conversi, 2007). Central to the homogenizing is the creation of a national identity. This has been mainly pursued through national education. Mass education and national history writing are among the primary tools in the nation-building process. Through these two primary tools, elites attempt to homogenize the masses and create a national identity.

As Althusser (1971) noted, schools can be seen as ideological state apparatuses through which elites reproduce the dominant ideology. Education in Turkey has been used as an instrument to reproduce a Kemalist hegemonic discourse for several decades. Schools aimed not only to instill the Kemalist worldview but also to legitimize state homogenization policies during nation-building as well (Yılmaz & Burak, 2011). The nature and objectives of education in Turkey have been subjected to change in the course of time and nationalism education has changed, too. In the early years of the Republic, state elites used schools and textbooks as a tool to impose a hegemonic state ideology, namely Kemalism. In the multi-party era, this changed to some degree but the use of education as a tool for reproducing the dominant ideology did not change.

This study has attempted to provide an analytical framework based on the relevant literature addressing nationalism, state-formation from a cultural perspective and the nation-building process. In addition, it has addressed how Turkish academia has approached nationalism education in the course of time. In Turkey, the change of political leaders and the revision in the dominant ideological framework of the state have led to changes in the content of history textbooks and curricula. Education has been used as an instrument to impose a hegemonic worldview upon the citizens.

In the formal education system in Turkey, nationalism education was conceived to be part of the state-centric modernization project which would transform the public and private domains in order to create an organic Turkish society out of the Ottoman Empire (Üstel, 2011). Framed by a strong state tradition, the Turkish state has and always had a strong say in what is taught and how it is taught throughout the country. Apart from that, Turkey is transforming itself following the official candidacy in the European Union in 1999. One important reform in the field of education is the inclusion of human rights themes into education.

Paulo Freire in his book *The Pedagogy of the Oppressed* (1970) argues that the traditional education system serves to support the dominance of the powerful people within society and thereby it maintains the powerful groups' political and economic status quo. According to Freire, to

overcome the oppression, education must be designed to inspire and enable the oppressed people in their struggle for liberation. Based on Freire's argument, nationalism education in Turkey should be redesigned to promote a more just society. Through creating a pedagogy of the oppressed, it will be easier to eliminate a social order that objectifies individuals. Consequently, the oppressed could achieve their full humanization. The democratization of Turkey's militaristic and particularistic elements included in nationalism education would be a critical requirement.

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Creating a motivation scale for secondary school students in Papua New Guinea

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Abstract

Motivation is important for students' mathematics learning at schools. Low levels of motivation among students in mathematics in Papua New Guinea (PNG) is a concern for schools. The present status of motivation can be diagnosed through survey questionnaires. The purpose of the present study is to examine the validity and reliability of a motivation scale questionnaire using the Rasch model (Partial Credit Model). The instrument consists of 20 survey questions that were adapted from Trends in International Mathematics and Science Study (TIMSS) and Programme for International Student Assessment (PISA) studies because there are no specific items developed in the PNG context to measure motivation scale as a single factor. These questionnaires are validated using ACER ConQuest 4.0 software. The item separation index indicates good variability of the items and the items functioned well. All infit measures of the motivation scale questionnaires satisfy the Rasch model's criteria except one item that does not conform to the requirements of Rasch measurement model.

Introduction

Motivation has been widely investigated in educational settings in recent studies (Chamberlin et al., 2018; Alkaabi et al., 2017). The decline of motivation among students in learning has been a challenge for teachers (Yanay & Yanay, 2008; Zusho et al., 2003; Wijsman et al., 2019). This is because intrinsic motivation prompts students to maintain interest and engage in mathematics activities. Students' poor performance in mathematics is due to a lack of motivation. As a result, the students' mathematics results decline and limit their progress into their preferred career pathways. This is evident from the National Education Secretary in PNG stating that national mathematics achievement levels have declined in the past decade and therefore need scrutiny (PNGDOE, 2006a, 2006b, 2009). This viewpoint is based on the annual Grade 10 and 12 students' mathematics national examinations results. Consequently, few students graduating from Grade 12 are able to enroll in universities to undertake mathematics-related programs such as engineering and medicine. Simultaneously, there is a significant number of Grade 10 students who do not have a chance to continue to Grade 11 and are therefore forced out of the education system (Joskin, 2013; Le Fanu & Kelep-Malpo, 2015; Rena, 2011). The decline in students' mathematics performance may be due to different contextual factors affecting their results.

This decline in mathematics results is indeed a great concern for the PNG government, parents, teachers and all those involved in young adults' education (PNGDOE, 2006a, 2006b, 2009). This state of affairs has increased interest for mathematics teachers, researchers, and policy makers in understanding the underlying decline in motivation as a factor to explain its crucial aspects associated with the poor mathematics performance. There are issues around how motivation influences the students' learning processes and the students' efforts to learn mathematics that affect the mathematics results. To clarify these issues, it is important to examine how learners' motivation could be assessed and what means to measure motivation are needed.

As a result, a survey questionnaire has been developed to investigate students' motivation. The most relevant for this purpose of measuring motivation scale, 20 questions were adopted and developed from two international studies: Trends in International Mathematics and Science Study (TIMSS) and Programme for International Student Assessment (PISA). These two studies define motivation as a form of engagement that is regulated and sparked by interest and to achieve a certain goal in the mathematical task (Eklöf, 2007; OECD, 2016; Martin et al., 2017). These two international studies (TIMSS and PISA) questions are adopted because no motivation scale has been developed in the PNG context until now and there is a need to establish one. The 20 questions are validated in the PNG context to determine their practical relevance in the context for the items to be used in future studies.

Literature review

Motivation is a significantly important factor for academic learning and achievement. According to Gholami et al. (2020), motivation is an important contributor to student achievement. It is also one of the most important ingredients of success in mathematics (OECD, 2013, 2014). Greater motivation can drive individuals, especially those with less talent, to reach their goals (Tuomi, 2006; OECD, 2013). Motivated students are more likely to succeed and perform better than students who have talent alone, and are more capable of setting goals for themselves to stay focused on their mathematics studies (Ross, 2008; Hopfenbeck & Kjaernsli, 2016). The motivation to achieve goals leads students to pursue work they perceive to be valuable and prompts them to compete with others (Ross, 2008; Hopfenbeck & Kjaernsli, 2016). In other words, students' motivations influence their learning and performance on assessments of mathematics. For instance, findings from international large-scale assessments, such as IEA's Trends in International Mathematics and Science Study (TIMSS) reveal that there is correlational and experimental evidence for the association of motivation with achievement with reference to longitudinal and cross-cultural comparisons (Martin et al., 2011).

In the context of this study, motivation is defined as the promotion of engagement of students in mathematics learning activities, as similar to the TIMSS and PISA studies (Martin et al., 2011). Students with less motivation are less interested and are more likely to be disengaged in learning mathematics (Yu & Lee, 2020). Instead, students with greater motivation get actively involved in mathematics tasks with pleasure and satisfaction derived from their participation, due to their competency level in mathematics (Ryan & Deci, 2017, 2020). Motivation to experience stimulation takes place when students engage in an activity in order to experience stimulating sensations derived from one's engagement in the activity (Gottfried, 2019; Liu et al., 2020). Gottfried (2019) and Heyder et al. (2020) highlight that typical motivations include interest, enjoyment, fun, self-determination and self-growth. Recent studies believe that students that have these motivational factors are engaged in learning mathematics (Ryan & Deci, 2017; Heyder et al., 2020; Yu & Lee, 2020). Students with motivation tend to do better at school (Gherasim et al., 2013; OECD, 2013), they set goals to achieve in mathematics that lead them to be more involved and be engaged in their studies (Eklöf, 2007; Hopfenbeck & Kjaernsli, 2016). This in turn provides students with "higher autonomous and internalised achievement motivation with higher self-esteem, stronger cognitive awareness and greater efforts invested at mathematics" (OECD, 2017, p. 94). A study by the OECD (2013) highlights that motivated students are typically autonomous individuals who believe that they can learn in various positive ways to solve mathematical problems. Another OECD (2017) study proposes that this attitude stems from a student's sense of responsibility and obligation in their approach to learning mathematics.

Students' participation in learning reflects on behaviors of persistence, concentration, attention, asking questions and contributing in mathematics learning (Fredricks et al., 2004). According to OECD studies, engagement in mathematics

enables students to be involved in active learning as it encourages them to think on the specific task (OECD, 2013, 2017). The role of engagement in mathematics learning is significant, and based around student-centred activities that support conceptual competences (Martin et al., 2011), and encourage active involvement in learning (Wilson, 2011; Martin et al., 2012). The OECD (2004) reports that increasing students' interest in the area of mathematics leads to higher test scores and student achievement in various contexts. A study by Cleary and Chen (2009) found a positive correlation between student interest, motivation, and better mathematics results. From these studies, it is clear that, when students are interested in their studies, they are more motivated, connected, and engaged in mathematical task (OECD, 2013; Nyman, 2017). The OECD (2013) recommend that specific strategies applied in mathematics teaching and learning can capture students' interest.

A synthesis of 12 empirical studies of the effects of examinee motivation on test performance by Wise and Demars (2005) discovered that the average difference between less motivated and highly motivated students was a 0.58 standard deviation. This indicates that motivation could have a significant influence on students' test scores. A cross-country study by Eklof et al. (2014) on the relationship and effort on the TIMSS Advanced mathematics test in 2008 in Sweden, Norway and Slovenia reveals that students in each country reported low motivation, but there was a significant relationship between reported effort and test performance. Furthermore, the OECD has also attempted to measure students' test motivation. For the second PISA cycle, in 2003, OECD developed and included a measurement of motivation, asking the 41 participating countries to include it in the booklets given to students (OECD, 2001). After the PISA 2003 cycle, the results showed overall that students across all participating countries answered they would have been more motivated to do the test if it had influenced their school marks (Butler & Adams, 2007). As it is evident from the literature review, there are mixed results from previous studies on motivation with some studies indicating that test motivation is related to higher performance, while other studies have not found such a relationship. What researchers have found is that females report higher levels of motivation to do their best while there tends to be a stronger relationship between high motivation and performance for males.

As mentioned earlier, in this paper, combined survey questions for the motivation scale from the TIMSS and PISA are used to acquire information on participants in an efficient way. The survey questionnaires/items in this study for motivation are therefore mostly adopted with modifications. The scale motivation (unobserved variable) was partly derived from the theoretical framework (see Appendix B) that was used for the researcher's PhD study to determine the student outcome (mathematics results). Even though these questionnaires were validated by experts, they are verified and validated again in the context of Papua New Guinea where the survey was carried out. The application of the items in the research context is taken into consideration for the suitability and usefulness of the instruments. As a result, items that are insignificant are abandoned in the final instruments. These new instrument (items) are likely to be valid in other countries and could be used accordingly in their context.

Aim and research question

This study aims:

(a) To validate the motivation scale by examining the validity of the adopted PISA and TIMSS survey questionnaire in the PNG context

(b) to measure the appropriateness of the survey questionnaires using the Rasch model.

The guiding research question for this study is: How valid and reliable is the survey questionnaire for motivation scale employed in PNG schools?

Methodology

This section of the paper discusses the methods used to collect and analyse the motivation scale questionnaire data.

Research methods and sampling procedure

This study applies a stratified random sampling technique (Creswell, 2008; Joncas & Foy, 2011). This technique allowed the researcher to arrange and divide the population of the schools in Port Moresby, PNG (target population) into groups, or strata, which shared common characteristics. For instance, schools are arranged within school type (private, government, church) in each suburb and the participants' gender group. The type of schools selected in this study are private, government and Catholic schools. This technique ensures balanced representation of each school and gender in the selected sample for Port Moresby, PNG (Joncas & Foy, 2011). The Grade 10 and 12 participants did a 40-question mathematics test in one hour. This technique allowed the researcher to arrange and divide the population of the schools in Port Moresby into groups, or strata, which shared common characteristics. For instance, schools were arranged within specific geographic regions, school type (private, government, church) in each region, and participants' gender group. This technique ensured a balanced representation of each school and gender in the selected sample (Joncas & Foy, 2011). The data was generated from October to November of 2017.

The primary data collected was from 729 students; i.e. 354 Grade 10 and 375 Grade 12 students, respectively from 15 different secondary schools in Port Moresby. The female-male gender distribution in both cohorts was approximately proportionate in each school. The 15 schools selected in Port Moresby were based purely on the amount of research work that was scheduled and the availability of the schools.

Instrument

The instrument used to collect data in this study is survey questionnaires for student participants. The survey questionnaires for students were designed to gauge students' motivation towards mathematics. Motivation scale items from the TIMSS 2015 and PISA 2012 studies are adopted and used in this study. This approach was taken due to the unavailability of motivation scale items in the PNG context. These two international studies mentioned above provided 20 items for the motivation scale (see Appendix A). As this paper aims to measure students' motivation, the motivation scale items are employed to collect data for Grade 10 and 12 students in Port Moresby. Grade 10 and Grade 12 students are selected in this study because they sit for PNG national examination each year. The results of these examinations continues to decline over the years and many students cannot do Grade 11 and go to universities and colleges, respectively. The PISA and TIMSS survey questionnaires are used because these two international studies measure students' motivation towards mathematics. Although PNG does not participate in the two aforementioned international studies, it is evident from reports of participating countries that the motivation can have an impact on the mathematics results of students. Therefore, these survey questionnaires are employed in the PNG context in the belief that they can measure the students' motivation and can assist in developing its own motivation scale. The scale consists of 19 positively-worded items and one negatively-worded item, using a four-point Likert-type scale: "strongly agree", "agree", "disagree" and "strongly disagree" (Penfield et al., 2008; Thomas et al., 2016). The four-point Likert-type scale was employed to get specific responses for the participants.

The motivation scale was adopted, modified, and developed from the existing instruments, with literature used as a guide. Adoption, modification and development of the scales required certain steps to ensure that the participants responded to the items with clarity within the time frame. The researcher provided a draft of the survey items to an experienced teacher in PNG to examine and make suggestions and comments based on the context of the research site. Further to this, the items were also provided to PhD candidates from the School of Education (The University of Adelaide). This procedure ensured that there was clear direction with clarity in language, brevity, clear format and structure and applicability to student and teacher respondents. This trial was timed in order to evaluate any difficulties that may arise when students in PNG are responding to the items. The two students' responses were incomplete, and so the researcher increased the timing and adjusted the content of the questionnaires, accordingly. Prior to the administration of this study, it was necessary to obtain ethical research approval from the University of Adelaide's Human Research and Ethics Committee (UAHREC). The UAHREC granted approval for this study to proceed on 14 July 2017 (Ethics Approval No H-2017-133). The questionnaires were validated through Rasch analysis due to the informative and practical approach this statistical technique has to assess the questionnaires that addresses issues of construct validity in educational assessment.

In order to further explore motivation scale, the study included 20 motivation items in the student questionnaire. These items were developed from already well-known scales described by the TIMSS and PISA studies. The motivation scale's 20 items were focused on the motivation scale as a single factor model. The motivation scale items were labelled Mtvn07-Mtvn26 for data analysis purposes as shown in Appendix A. Item responses were coded 1, 2, 3 and 4, corresponding to the categories "strongly disagree"," disagree"," agree" and "strongly agree", respectively. Moreover, item responses that were missing or omitted were coded "9", which is an arbitrary value assigned for recognition with the statistical software as a non-response (Blackwell et al., 2017). In order to keep scoring consistency, the single negatively-coded item was reverse scored (Crenshaw et al., 2017). The items were recoded so that the higher scale scores reflected more positive motivation. Motivation scale used in the PNG study consists of 20 items measuring motivation.

The 20 items are adopted from PISA and TIMSS studies and are labelled accordingly as shown in Appendix A. Item Mtvn01 'I am prepared for my mathematics examinations' attempts to measure whether preparation in examinations has a motivation factor in learning mathematics. Item Mtvn02 'Jobs that require mathematics skills seem interesting to me' aims to find out how jobs that require mathematics skills motivates students to be involved actively in mathematics. Moreover, Item Mtvn03 'Learning mathematics will help me get ahead in the world' measures the perception of mathematics in the real world. Items Mtvn04 'It is important to do well in my mathematics class' and Mtvn05 'Doing well in mathematics will help me get into university/colleges' seeks to measure the student's motivation in learning mathematics. Furthermore, item Mtvn06 'Learning mathematics will give me more job opportunities' and Mtvn 07 'Learning mathematics is worthwhile for me because it will improve my career prospects' attempts to understand the students' motivation in learning mathematics regarding career and jobs in the future. The item Mtvn08 'I keep studying until I understand mathematics material' turns to measure how motivated students are in studying mathematics in order to understand the concept in the material. Similarly, Mtvn09 'I take part in mathematics competitions' tries to understand at what level students are motivated in taking part in the mathematics activities. Additionally, item Mtvn10 'I do mathematics more than two hours a day outside of school' seeks to find out whether students are motivated to learn mathematics at their own time outside of school.

The items Mtvn11 'I have my homework finished in time for mathematics class' and Mtvn12 'I work hard on my mathematics homework' gauge to measure if students are motivated to do their mathematics homework. Item Mtvn13 'I keep my mathematics work well organised' desires to gauge students' motivation level when their math work is organised. Moreover, item Mtvn14 'I talk about mathematics problems with my friends' investigates how students are motivated to share their mathematics work with student mates. Items Mtvn15 'I listen and pay attention in mathematics class' and Mtvn16 'I avoid distractions when I am studying mathematics' seeks to examine how students are still motivated and engaged in mathematics despite

distractions from peers. Item Mtvn17 'Mathematics is one of my favorite subjects' aims to discover the motivation level when mathematics becomes one of their favorite subjects. Finally, Item Mtvn18 'I am interested in the things I learn in mathematics', item Mvtn19 'The teacher did not get students interested in the material' and item Mtvn20 'It is interesting to learn mathematics theory' is about students to find out the kind of motivation that increases interest to be engaged in mathematics. These items descriptions measure the single motivation scale in this study.

Data analysis criteria

The Partial Credit model is used to analyse the data. The item difficulty level and person ability of the motivation scale are measured on the same continuum using ConQuest 4.0 software. The Rasch analysis consists of several analytical steps and criteria to determine the validity of each of the motivation scale item. The first criterion is unidimensionality: One of the basic assumptions of the Rasch model is unidimensionality, which refers to the existence of a primary construct (dimension) that accounts for variance in sample response. This indicates that the items in a test measure one single latent ability. For instance, a rectangular solid has many attributes such as length, height, weight, volume and density. The focus is only one of these attributes for meaningful estimation of the objects under scrutiny (Bond & Fox, 2016).

Moreover, evaluation of fit indices for all items and persons based on Infit and Outfit statistics allows us to determine the unidimensionality of the instrument. In the standardised mean square (ZEMP) of fit statistics, the mean square value is transformed, with sample size to produce a distribution such a t. The infit MNSQ statistics used in this paper is used for item fit. The acceptable values of the MNQS are placed in the interval between 0.7 and 1.30 where 1 is the ideal (Tejada et al., 2011; Bond & Fox, 2016). There are no hard rules on cut-off scores; Skrodal (2010) suggests an infit MNSQ range of 0.6-1.4 as reasonable for data collected from a survey and this criterion is employed in this study. In ZEMP (t value), 0 means that the model satisfactorily predict the observed data, and an interval between -2 and 2 specifies acceptable fit (Tejada et al., 2011; Bond & Fox, 2016).

The second criterion used to judge the instrument is the separation index and separation-reliability index: The separation index indicates how well the scale separates items (i.e., item separation), and individuals (i.e., person separation: Wright & Stone, 1999). The minimum value for the separation index is 1.0. A high separation index indicates adequate discrimination for either an item or person. Item separation index can be used as an index of construct validity and the person separation index can be used as an index representing criterion validity (Wright & Stone, 1999; Bond & Fox, 2007). Separation-reliability denotes the feasibility of replicating item or person placements within measurement error for another sample. A separation-reliability close to 1.0 indicates a high degree of confidence for the placement of either an item or person (Bond & Fox, 2007). The third technique is to check for the discrimination index (point biserial) to judge whether each of the motivation scale items are discriminating with the higher and lower ability respondents.

Rasch analysis results

The motivation scale in this study, applied to survey students in Port Moresby, PNG, was adapted to a different context than the items' original contexts in PISA and TIMSS assessment. Hence, the utility of the items is checked using the Rasch model with ConQuest 4.0, software. The partial credit model (PCM) assumes that the distance between the thresholds of the items is different (Eggert & Bögeholz, 2010). Hence, in this study, PCM is employed to analyse the items for the motivation scale response categories because it is a parsimonious model and minimises the mean square error. This procedure is useful for surveys such as the motivation scale items, where they are not marked for correct or incorrect answers (Penfield et al., 2008). Survey results from the analysis, appearing in Table 1, demonstrate that data fits the model well which indicates that PCM is a more parsimonious model (Wang & Wu, 2011). The 20 items in the motivation scale are subject to item analysis using the PCM. This is carried out to test the unidimensionality of the 20 items measuring the construct (motivation). This involves examining each item's fit statistics using statistical criteria and procedures.

Table 1 shows that the basic data relating to the responses of the different categories on each item. The proportion of respondents who rated each category varied substantially across items. The proportion varied from 6.1% for strongly disagree for Mtvn01 and Mtvn15, respectively ('I am prepared for my mathematics examinations' and 'I listen and pay attention in mathematics classes') to 52.3% for Mtvn13 ('I keep my mathematics work well organised'). The pattern of agreement across categories for Mtvn14 and Mtvn13 varied, with 31.2% strongly disagreeing or disagreeing with Mtvn13 ('I keep my mathematics work well organised') and 41.6% strongly disagreeing or disagreeing with Mtvn15 ('I listen and pay attention in mathematics class'). These patterns of response affected the mean estimate values of the items. The separation reliability index of the item is the analogue to the Cronbach alpha (measure of scale reliability). In this case, sample reliability was 0.99 and is considered to be good. This indicates that the items are discriminating between low and high-ability respondents showing minimal measurement error. Separability focuses on whether the scale is defined by the distinct hierarchy of items.

Table 1 shows that all items fit the model with the INFIT MNSQ criteria of 0.6 to 1.40 (Bond & Fox, 2007, 2016). However, the t- values of Mtvn25 ('The teacher did not get students interested in the material') is 6.8, which is not within the acceptable fit criteria of -2 to 2, and as such was non-significant for the model. Further, the item thresholds are disordered and had a low discrimination index of 0.21. The researcher decided to delete the item due to violation of the Rasch model requirements (Wu & Adams, 2007; Wu et al., 2016). The results of the final run of analysis shown in Table 1 indicates significant improvement on the statistical fits of the items. However, Mtvn06, Mtvn12, Mtvn17 and Mtvn18 t-values are still above the criteria discussed before

despite significant changes in their values. Since this is not a "high-stakes" test, though a more lenient approach was taken especially with the t-values of those four items.

Moreover, Table 1 demonstrates the different range of item endorsement of the 20 calibrated survey items from -1.47 to 1.74 logits and is connected to a standard error of -0.03 to 0.18 logits. These items show difficulty index measures, identify the different response level of an item and classify the level of an item as easy, moderate, or hard to endorse (Zainuri, Asshaari et al. 2016). Furthermore, the results of the point biserial index (rpb) of the items in Table 1 ranges from 0.21 to 0.66. This result shows that the items are discriminating and differentiating among respondents, and it implies that the items indicate a relationship between the respondents' performance on the given item (correct or incorrect) and the respondents' score on the overall test (Wu & Adams, 2007; Wu et al., 2016; Quaigrain & Arhin, 2017). It is also evident that examinees endorsed the items with higher options more frequently than lower options (Wu & Adams, 2007; Adedoyin & Mokobi, 2013).

Table 1. Analysis outcome of the Rasch measurement model (n=729).

	Proportion responding in each answer category				Estimate values (logits) for items and infit (MNSQ)				Item threshold		
Item code	1	2	3	4	Estimate/(SE)	Infit MNSQ	ZSTD (t)	Pt Bis	1	2	3
Mtvn01	6.1	21.1	45.3	26.9	0.23 (0.04)	1.02	0.4	0.46	-1.09	0.16	2.8
Mtvn02	2.1	11.2	50.4	36.3	0.21 (0.04)	0.98	-0.4	0.55	-2.12	-1.27	1.47
Mtvn03	1.1	6.1	49.6	43.2	-0.69 (0.04)	1.06	1.0	0.39	-1.81	-0.21	1.12
Mtvn04	6.4	28.3	42.2	22.5	-1.47 (0.05)	1.01	0.2	0.36	-1.43	-1.32	0.89
Mtvn05	2.7	20.5	45.6	23.1	-0.99 (0.04)	1.14	1.9	0.29	0.49	1.63	2.23
Mtvn06	4.3	19.2	40.5	35.3	0.14 (0.04)	1.15	2.3	0.38	0.47	1.7	2.37
Mtvn07	1.1	5.1	38.9	54.7	-0.14 (0.04)	1.10	1.8	0.39	-1.17	-1.29	0.88
Mtvn08	3.5	7.7	54.4	33.9	-0.58 (0.04)	1.00	-0.0	0.46	-0.75	0.39	2.17
Mtvn09	1.6	17.3	48	32.5	1.74 (0.03)	1.08	1.6	0.52	-1.7	-0.45	1.33
Mtvn10	2.1	7.5	42.1	48.0	1.34 (0.03)	0.99	-0.3	0.56	-2.17	-0.95	0.19
Mtvn11	1.6	5.1	20.8	72.5	0.92 (0.04)	0.97	-0.6	0.56	-0.46	1.78	2.76
Mtvn12	2.1	7.5	43.5	46.9	-0.01 (0.04)	0.86	-2.4	0.63	-1.1	-1.05	0.62
Mtvn13	52.3	36.8	7.2	3.2	0.34 (0.04)	0.97	-0.7	0.57	-1.03	0.26	2.37
Mtvn14	4.5	26.7	44.3	24.5	0.13 (0.04)	1.08	1.5	0.48	-0.84	1.36	2.28
Mtvn15	6.1	35.5	41.9	16.5	-0.67 (0.04)	0.89	-2.0	0.55	-1.49	0.5	2.45
Mtvn16	1.1	4.5	36.5	57.1	-0.07 (0.04)	1.10	1.9	0.44	-2.15	-0.5	1,26
Mtvn17	0.3	1.3	9.1	89.1	0.33 (0.03)	0.90	-2.1	0.66	-2.57	0.31	1.91
Mtvn18	0.3	1.1	15.2	83.2	-0.44 (0.04)	0.83	-2.2	0.64	-1.29	-0.91	1.16
Mtvn19	43.7	23.2	20.0	13.1	0.49 (0.03)	1.37	6.8	0.21	-0.29	-1.29	1.16
Mtvn20	12.3	39.2	38.1	10.1	-0.35 (0.18)	0.98	-0.3	0.48	-2.76	-1.62	0.72

Note: Separation Reliability = 0.997 ,Chi-square test of parameter equality = 5809.80, df = 19, Sig Level = 0.000

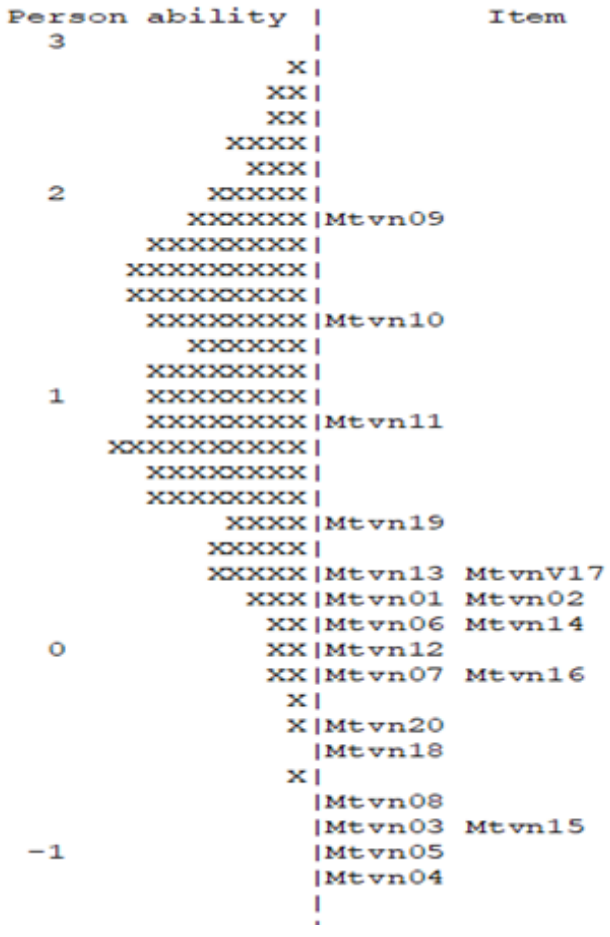

Figure 1. Wright-map of the 20 items of motivation scale as a single level factor.

Figure 1 contains an examination of the Wright-map, showing most of the items located around the mean (zero logits), whereas the majority of the respondents' ability levels are above the average. This indicates that most of the respondents have higher motivation and the items are easy for them to respond. These items are easy because they are located below logit -1 and respondents with both low and high ability level answered the items correctly. The majority of the respondents have greater than 50% chance of endorsing items with difficulty level below their ability, and vice versa.

Discussion and conclusion

Construct validity of the motivation scale questionnaire

The main purpose of this study is to provide more information about improving the questionnaires of the motivation scale. This is because high motivation leads to greater aspiration in mathematics= and science-related fields. As such, as shown in Table 1, item Mtvn19 does not satisfy the Rasch model's statistical criteria and threatens the validity of the motivation scale and is not supporting the unidimensionality structure. This means the item violates the Rasch model's criterion and there is lack of consistency in interpreting the underlying measure. The item is not measuring the same latent construct as the rest of the items in the survey. Infit

of 1.37 of Q19 ("The teacher did not get students interested in the material") represents an uncertainty in the data. This item does not conform to the Rasch model's criteria and is deleted. Apart from this item, the model fits the data well.

The person-map in Figure 1 (from left to right) is employed to assess the motivation scale on which both item and the respondents are calibrated on a logit scale. In Figure 1, the numbers on the far left are from -1 (low motivation) to around +3 (very high motivation). The relative item difficulty is plotted on the right side of the scale and personal motivation estimates on the left side of the same scale on the person-map. The respondents at the top of the map represent higher motivation to endorse the questions while the person at the bottom demonstrates low motivation to endorse. Similarly, the items on the top are more difficult to endorse while the ones at the bottom are relatively easier to endorse (Bond & Fox, 2007, 2016). The logit zero on the person-map is set at the average item difficulty and overall, the mean motivation of students is higher than the average difficulty. The positive logits values represent the items that demand highest level of motivation. Students' motivation and current item difficulties are less widely spread, but there are major gaps at the top of the maps where students' motivation does not match the high response level items and at the bottom where more items matched low motivation. The results indicated that easy items are required to meet the need of low motivation participants. In addition, five items in the person-map do not correspond to the respondents' endorsement motivation and are very easy (Mtvn03, Mtvn04, Mtvn05, Mtvn08 and Mtvn15). Consequently, respondents have more than a 50 percent probability of endorsing the items accordingly (Boone et al., 2011), while the Rasch analysis shows that motivation parameters are higher and most of the items had slightly inappropriate coverage. The results of the Rasch model thus demonstrate room for improvement of the motivation scale questionnaires.

The study contributes to the methodological significance through reliability and validity of a mathematics motivation scale using two psychometric approaches (unidirectionality and separation-reliability index) as a way of comparison. This research study involves questionnaires that examine motivation scale. The survey instruments for scales were validated and calibrated to obtain reliable data. This validation of the construct questionnaires was carried out through the Rasch Model, using ConQuest 4.0. The findings of this study reveal that researchers can produce different results from the construct validation and that depends on the selection of analysis methods employed. This is because using a rigorous method such as Rasch analysis for measuring motivation scale has advantages and disadvantages of the psychometric properties.

The use of a motivation scale questionnaire in research and instruction

The researchers, teachers and other educators will be able to readily assess students' motivation to learn mathematics if the motivation scale is further improved as stated above. In terms of research, these motivation scale questionnaires can be used to find the relationship between other educational variables through statistical tests. For instance, the students' motivation to learn mathematics differs from their career goals, parent involvement in their learning and prior knowledge in mathematics. Furthermore, the questionnaire can also be used with other research methods such as qualitative methods using interviews and group discussions, for comprehensive insight into their motivation in learning mathematics. The questionnaires can be used as an instructional tool to find reasons for the decline in motivation among students that can assist teachers to adjust to different teaching styles to develop a conducive learning environment that motivates students. It also assists teachers to identify unmotivated students and foster a positive teaching relationship with students. Moreover, the principals/head teachers and faculty heads could track low-motivation students who are more likely to experience difficulty in completing their studies (degree programs) at various institutions. This process can assist institutions to set strategies to improve student motivation by providing alternative programs for students at risk and by reorganising schools.

The students' scores on the motivation scale produce the logit scores with the Rasch analysis rather than raw scores because all items have different response levels and thus different items do not contribute equally to the motivation scale's total score. In addition, the items of the motivation scale instrument are Likert-type scales, which could be regarded as an ordinal scale. The ordinal scale does not have the same distance between a score of 1 (Strongly disagree) and 2 (Disagree), and a score of 3 (Agree) and 4 (Strongly agree); it is thus not permissible to add the scores of all item responses. The logit scores are generated through consideration of each item difficulty and the transformation of ordinal scales to interval scales.

Student motivation is key to academic success, so efforts to make better policies for practices needs attention to increase student motivation in schools. The instrument of motivation scale validated in this study informs the status of student motivation. It further explains the association between performance and motivation status to provide an indication of the extent to which the education policies should target unmotivated students. This study should inform teachers, educators, and principals/head teachers and policymakers who are interested in improving student motivation.

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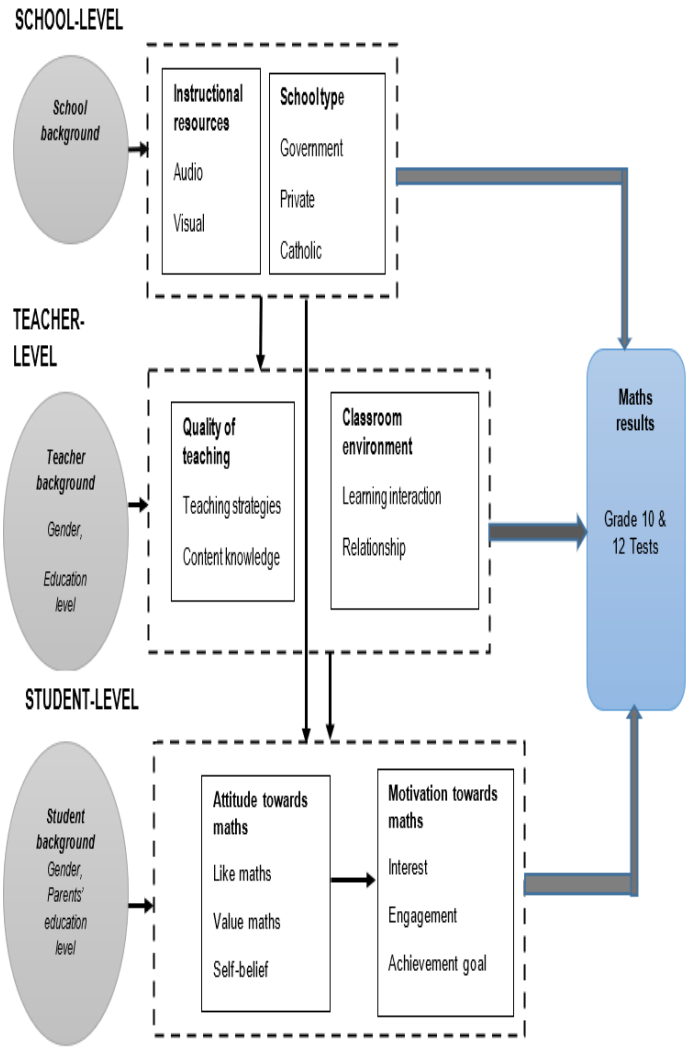
Appendix

Appendix A: Summary of items in the motivation scale used in the study.

Item code	Item Text	Item originated from/Item No
Mtvn01	I am prepared for my mathematics examinations	PISA (36c)
Mtvn02	Jobs that require mathematics skills seems interesting to me.	TIMSS (20j)
Mtvn03	Learning mathematics will help me get ahead in the world	TIMSS (21a)
Mtvn04	It is important to do well in my mathematics class	TIMSS (21b)
Mtvn05	Doing well in mathematics will help me get into university/colleges.	TIMSS (21e)
Mtvn06	Learning mathematics will give me better jobs in the future	TIMSS (21i)
Mtvn07	Learning mathematics is worthwhile for me because it will improve my career prospects	TIMSS (21f)
Mtvn08	I keep studying until I understand mathematics material	PISA (36e)
Mtvn09	I take part in mathematics competitions	PISA (38d)
Mtvn10	I do mathematics more than 2 hours a day outside of school	PISA (38e)
Mtvn11	I have my homework finished in time for mathematics class	PISA (36a)
Mtvn12	I work hard on my mathematics homework	PISA (36b)
Mtvn13	I keep my mathematics work well organized	PISA (36i)
Mtvn14	I talk about mathematics problems with my friends	PISA (38a)
Mtvn15	I listen and pay attention in mathematics class.	PISA (36f)
Mtvn16	I avoid distractions when I am studying mathematics	PISA (22h)
Mtvn17	Mathematics is one of my favorite subjects	TIMSS (20i)
Mtvn18	I am interested in the things I learn in mathematics	PISA (31f)
Mtvn19	The teacher did not get students interested in the material	PISA (35e)
Mtvn20	It is interesting to learn mathematics theory	TIMSS (20e)

Appendix B: Proposed theoretical framework for the study (OECD, 2004 & OECD, 2010).



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Work as vocation. An interview with Professor Antonia Darder about her life, research, teaching, activism and art

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Abstract

Professor Antonia Darder was extremely kind in giving us an extensive interview, despite her mourning the recent deaths of family members and friends. Professor Darder is an internationally recognized scholar, artist, poet, activist, and public intellectual. She holds the Leavey Presidential Endowed Chair in Ethics and Moral Leadership in the School of Education at Loyola Marymount University and is also Professor Emerita of Educational Policy, Organization, and Leadership at the University of Illinois at Urbana-Champaign.

This interview offers Antonia Darder's highly inspirational narration of how a colonized, impoverished minority woman became, against all odds, a highly regarded professor and activist-scholar. Having migrated from Puerto Rico to East Los Angeles at the age of three, Antonia Darder discusses her extremely difficult, impoverished childhood and youth, becoming a mother of three at the age of 20. She shares her experiences with racism and sexism as well as her take on critical pedagogy that is heavily influenced by Paulo Freire with whom she worked before his death in 1997. She talks about her admiration of Freire and her main takeaways from his critical pedagogy, and also provides an overview of her own impressive body of work. In this expansive interview, there are many fascinating snippets: about her absolute commitment to her doctoral candidates; the historical influence of the Ku Klux Klan at a university where she taught that was uncovered in a documentary by her students and herself; and her being an artist as a creative form of survival. In the end, a holistic image of Antonia Darder emerges in which work is a vocation and her life, research, teaching, activism and art are all intrinsically intertwined.

Professor Tania Aspland (T. A.): Thank you so much, Professor Antonia Darder, for making yourself available! We are extremely sorry that you're going through such a difficult time. Our first question is very personal, we hope that's okay. You were born in Puerto Rico and migrated with your mother to East Los Angeles at the age of three. You grew up in abject poverty with a schizophrenic and abusive mother, having to take care of your sister and not having a proper childhood. You left home at the age of 16 and were married with three children by the age of 20. Your childhood and youth must have been extremely trying. You have said that your greatest accomplishment is that you have survived. How did you experience growing up and your schooling?

Professor Antonia Darder (A.D.): Growing up, I went to public schools and lived in a very impoverished community in Los Angeles. As you know, resources are always so much less in schools within subaltern communities. My experience at my home was so intense, there was so much tension, there was so much dysfunction, and there was always so much chaos. It was a very chaotic way to grow up. I consider the dysfunction I experienced as deeply related to the individual and collective trauma of colonization and poverty faced by so many families that are barely able to make ends meet. And in many ways, my experience was akin to growing up in a war zone, a war zone in my home with no place to feel safe. Of course, this did not mean that I was not loved, but that stress my mother experienced was overwhelming for her and there were no resources within the society at that time to help our communities cope with the struggle of surviving socially and economically in a racializing world.

What happened for me, was that school felt safer than home, because at least being in school, I wasn't being knocked around and yelled at in the same ways. And in many respects, school became a haven, and because it became a haven, it was easier for me to invest in schooling and invest in learning. It provided me hope that I could create a different life in the future. And so, it was a way to survive, it was a way to be able to withstand the hardships of the early life, the first 15 years of my life.

> ***In many ways, school became a haven, and because it became a haven, it was easier for me to really invest in schooling and invest in learning.***

It was a different time, when I look back. There wasn't a lot of attention being paid to what was happening with the children, especially low-income children. I think the biggest concern was, especially in a Spanish-speaking community, that we were speaking English. The main concern was that we weren't talking to each other in Spanish, which was considered detrimental to our learning. In fact, we would often be reprimanded for speaking in Spanish and I spent lots of hours in the cloakroom sitting alone, because I would forget and start jabbering away in Spanish to my classmates. Those were the elements that were difficult: the cultural and linguistic clashes that went on. But there were other elements to it: it was physically safer to be at school than it was at home.

Figure 1: Antonia Darder and her mirror image (1994).

I think I was lucky because I did have a few great teachers and this is why I have such a commitment to, and such a respect for, teachers and also why I understand the incredible role that teachers can play in the lives of young children from subaltern communities. For me, my first-grade teacher, Mrs. Lewis – I even still remember her name – she was an African American teacher, she was very comforting and I always felt so safe with her. I felt like she liked me, I felt seen by her. Often, what happens for us and what happened for me with many of my teachers was that I didn't feel seen and I didn't feel welcome. But with a few teachers that I remember, there was this feeling that they wanted me to learn, and they were happy that I was there. At least that was the feeling that I had with them as a child.

> ***I was lucky because I did have a few great teachers and this is why I have such a commitment to, and such a respect for, teachers and also why I understand the incredible role that teachers can play in the lives of young children from subaltern communities.***

Then in fourth grade, I had a teacher from Trinidad, Mr. Horace Vititoe—and I actually remember his name, too. Mr. Vititoe was an important teacher for me, and it was also an important time as a young student because school was getting harder by fourth grade. He had a storytelling way of teaching, but he was also an old school disciplinarian with us, because he expected us to achieve, to get all our spelling words correct and things of that sort. There was a sense that he had expectations for us that we could and would be successful. And because we felt that he thought we could be successful, many of us were very academically successful in his class. There were also teachers who really didn't give a damn, they really didn't care whether the kids passed or not, they weren't very attentive towards us children and did the minimum.

I was learning the difference between teachers who are attentive and who love what they're doing, and who care about the children, and those teachers who are just going through the motions, doing their job. When I was in junior high, I had Mrs. Wasserman. I remember her saying to me, 'you can go as far as you want to go, don't ever let anybody make you feel like you can't'. This reflected that individual ethos, which is part of most Eurocentric schooling anyway. It is very individualistic, it's focused on the individual achieving. There isn't a sense of our collectivity or that we existed as a community of students who had to work together to achieve. But nevertheless, with such little support, it was important to have a teacher who I felt sincerely cared about me. I remember her giving me a little book where she wrote me a note when I graduated from junior high school. It's just little things like that that make a child feel seen and feel like they have some value to an adult, especially children like myself who are struggling, whose parents are deeply traumatized, or whose families are struggling to survive.

Again, I understand what was happening to my mother as part of colonization and the impact of it on her life; and how poverty impacts people that are trying to figure out how they're going to put food on the table for their children, while working these menial jobs and not ever having enough money to get through the week. These conditions are part of everyday life and they impact people, especially when they constantly receive the false message that 'your inabilities are completely your own fault'. There's no talk about the fact that historically and at the present moment, there's been a tremendously unequal economic system that produces subjects who are politically disempowered and who live in poverty, a reality absolutely needed in order for the capitalist system of inequality to be perpetuated. Instead, people are given the message that their poverty is their fault, that if they only worked harder…

Yet, my mother worked very hard. Poor working-class people work very hard. They work harder than people who live in comfortable bourgeois conditions of life. Working-class people work harder in terms of the grit that's necessary to be able to get through the day. And often there's the idea or the message that 'if you are impoverished then you're an inadequate human being, you're a subhuman being, deserving of second-class status'. Often, you're also dealing with racism, you're 'othered', there's a xenophobic process of othering. Because of all this, when I talk to teachers, I always go back to how important their relationships with students are and how they can make an enormous difference in the lives of oppressed students.

I will be 70 next month and that I can still remember the name of my first-grade teacher tells you the power that a teacher can have. The sad thing is that society itself does not truly value children nor early education. It doesn't value the labor of teachers in the way that it ought to, it doesn't provide them the resources that are needed; it often expects them to produce, to labor in isolation. Given the pandemic, we're seeing the impact of that perspective in teachers. Just a few days ago, I read an article that was reporting on why 50% of US teachers are ready to leave the profession, given the impact of the pandemic on their lives and with so little support provided for them or their students (e.g. Streeter, 2021).

And so many teachers, even when they've come back into the classroom, moving from virtual teaching back into the classroom, they are facing the problem that virtual education only works for a small percentage of children. My granddaughter, who's a third-grade teacher—this is her first year of teaching—had to complete her teacher education during the pandemic. When she went into the regular classroom this year, she found that over 50% of the kids didn't learn the lessons of the last couple of years. So, she's not only having to teach third grade, she's having to teach second-grade lessons and some first-grade lessons for some of the kids, if she's going to be able to reach them and support their learning. And even worse, the resources aren't there. For one teacher to have 40 children and to have to be carrying that extra workload, and to have that workload not even be truly acknowledged, is part of the reason why many teachers are saying: 'Forget it! I went into teaching because I wanted to teach, I love kids, but the conditions just are atrocious'.

> ***Many individuals are saying: 'Forget it! I went into teaching because I want to teach, I love kids, but the conditions just are atrocious'.***

I think what is especially important for me here is that often we don't realize that, when as critical scholars we talk about lived history – or when Paulo Freire talked about the importance of our personal history – this is important because from those histories, we can garner tremendous bits of wisdom that can help us to write theory in ways that are truly grounded in the realities of people's lives. When we're working with students or working with teachers, it's important to listen to what they have to say. So that we can accurately access with them the knowledge of their own experience and see how that might help us all develop greater compassion for our students. I say this because I firmly believe that love and compassion are absolutely essential to the learning process, a relational aspect of teaching often not spoken about in educational formation. Yet our capacity to love our students and to have compassion helps us to understand that they're coming from different contexts and different realities. This is an understanding that opens us to important knowledge and information about our students; they're not little things

or machines coming in to be fed with knowledge. They are human beings, they're organic beings that learn best when the conditions are created that truly honor and respect their humanity, where conditions are created that help them to scaffold their learning, to build new understanding upon what they already know.

I think that often, there's tremendous disrespect toward students because of the way that adults often see children. There's a sense somehow that what children have to say doesn't have any real meaning or that children can't possibly understand what's happening to them. But in my practice, I've not found this to be true. Children may not speak in the words that adults speak, but if you listen to them and you sincerely engage them with respect for the meaningfulness of what they have to bring to the conversation, children have a lot to say about what's going on in their world. But by the time they are teenagers they often have become very reticent to speak, because they don't feel that adults respect them or really care about what they have to say.

Children from some subaltern communities often feel that way. If they're not able to immediately get with the program or dominant expectations of the school, they're judged as less intelligent, less capable, and often treated as biologically inferior or culturally defective. And this can happen, despite how intelligent they may be. This deficit view of working-class children of color is pernicious. I experienced it as a kid, and I've seen it in classroom teachers. I've experienced it in my work with educators by how they talk about their students. For this reason, it's important to challenge teachers to be reflective about what they're saying, and its possible impact on children's lives. The things teachers say will stay with children – especially those things that feel hurtful and demeaning, they will stay with children for a long time. Long after they've forgotten the words, the feelings of hurtful words can persist, especially with respect to being a learner in the classroom. This is to also say that the confidence (or lack of confidence) they feel or the security (or insecurity) they feel about their intelligence, is cultivated very early in life within the classroom environment. Again, this speaks to the impact that teachers can have on the lives of their students.

Jürgen Rudolph (J. R.): Thank you so much for this wonderful answer. Personally, I grew up in Germany, and I grew up in a lower middle-class environment. So, I didn't have all these issues with racism and stark poverty that you encountered obviously, but it rang very true what you said that what our teachers tell us is very important. I remember being called 'stupid' and so on, and it was a chip on my shoulder as a result of that.

A.D.: Yes, I truly understand. What is very important for us to understood is that we must work to create a culture that is humanizing for everyone. All children need to experience a classroom culture that is humanizing, that reinforces their value as a human being. For me, that means caring for others, a sense of consideration, a sense of respect for one another, a sense of learning to work together, to believe that we are better together than we are apart; that sense of building a truly democratic context where people feel like they can speak, they can have a voice, they can participate in making their destinies. All of these elements are integral to a liberating culture of schooling. I may talk about it in relationship to subaltern students because that has been the focus of my work and my experience. But our experience as people of color, for example, is as human as anyone else's. And this goes across all communities, across all classes, across all genders, across all sexualities, across all levels of physical and cognitive abilities.

What we're searching for is often this sense of being recognized for our value as human beings, a sense of meaning, a fullness of life. There's something tremendously humanizing about experiencing a sense of being welcomed and belonging. In contrast, for example. as soon as there's name-calling going on, and if a teacher doesn't attend to it, they lose an important opportunity to teach the value of building community. Name-calling has a lot to do with kids feeling like they have to posture in order to be accepted. Indirectly, this also casts them into a dehumanizing social environment of competing for their worth. This competitiveness is ensconced in the culture itself. As such, values of emancipatory education, social justice, and a truly emancipatory vision of life must address such issues in the everyday life of the classroom. This is just as important as any other topic or subject: how students engage with one another, how they feel about themselves, how their relationships in school deeply influence who they will become in the future.

J.R.: I was absolutely shocked when I was reading recently – I know very little about Puerto Rico – that about one third of the women in Puerto Rico were forcibly sterilized. Your mother was one of them?

A.D.: Right. In the early '50s, there was a U.S. policy, Operation Bootstrap, it was an economic policy, with different initiatives. One of them was the sterilization of Puerto Rican women. It had to do with all sorts of moralistic colonizing beliefs about women of color and our inability to control our sexuality. Similarly, pregnancy was seen as interfering with women being good workers. This was a time when women were being moved into the workplace; and having all these children was going to disrupt the production line. There was then a decision made that the sterilization of Puerto Rican women would be part of the initiative for the modernization of Puerto Rico. This echoed what we saw with Native American women and African American women in the United States and their experience of forced sterilization. In a variety of cases, in the midst of child birthing labour, women were unknowingly asked to sign a document consenting to their sterilization after delivery. It was often done in coercive ways. In the case of Puerto Rico, by the early '70s, 30% of the women had been sterilized. My mother was one of them. At 19 years-old, when my sister, her second child, was delivered, she was asked to sign the consent, they said: 'it will be the best thing for you'. This practice was, of course presented as benevolent, but it was actually very authoritarian and tied to the social control of the island's population.

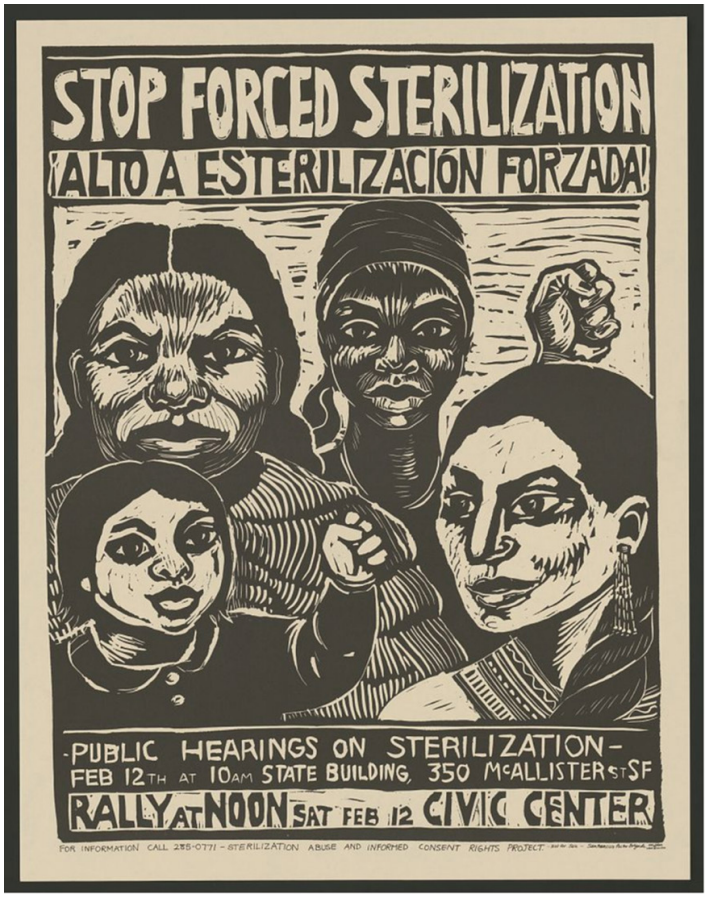

Figure 2: Poster for a 1971 Stop forced sterilization rally in San Francisco. (Not only many Puerto Rican women, but also Black and Native American women were sterilized in the U.S. in the 20th century under questionable circumstances, sometimes forcibly.) Source: Library of Congress. Cited in: Onyekweli (2020).

J. R.: Thank you so much for sharing about your childhood and youth! I'm in agreement with your analysis. While being a young mother and still living in poverty, you attended Pasadena City College, where you earned a degree in Nursing. Later you attended Cal State Los Angeles for a Bachelor in Rehabilitation Counseling. Later, you received a Master's degree from Pacific Oaks College in Human Development and in 1989, a doctorate in Education from Claremont Graduate University. How was your experience studying as a Latina woman in these various educational institutions? Could you share with us some of your encounters with racism and sexism?

A.D.: It's an experience that many women who come from subaltern communities and who finally get into an educational context encounter. What makes it particularly difficult is that often, the way that sexism and racism is expressed is subtle. The way I ended up in nursing school is a good example. I wanted to do pre-med but the counselor essentially told me: 'you've been saddled with three children. It's going to take 10 years for you to get a medical degree. You don't have any money, you don't have any resources. What you need to do is go into a nursing program'. What was interesting is that about a year and a half before that, the first time I tried to go back to college, I went to a community college in East Los Angeles which is a Spanish-speaking Latino community – predominantly of Mexican origin, but as Puerto Ricans, we speak Spanish, so it was natural that we would find ourselves in that community. There too I was discouraged by an academic counselor of pursuing pre-med. He also suggested nursing. Finally, I said: 'Well, okay, then the Registered Nursing Program' which is the full nursing program. To which he said: "Oh no, my dear, you people do better in vocational programs'. I was really young, 20 years of age. And it just didn't compute. I didn't know what the hell he was talking about. But he was very clear about his opinion. He was going to enroll me for the LVN [Licensed Vocational Nurse] program. There's nothing wrong being an LVN. But that's not what I wanted, what I wanted was to study pre-med. And there was so much discouragement around that, which I firmly believe had to do with me being a woman, living in poverty, and being of color.

When someone says 'you people', there's clearly some kind of blanket, stereotypical notion held about our capacity, and it was a very clear message about our intellectual inferiority. His message was that I should go into this program that wouldn't require so much intellectual capacity. He's probably dead now, and I do not remember *his* name [laughs heartily]. But sometimes I wish I could go back and just throw my 30-page CV in his face [interviewers laugh]. I know this is very petty and very childish, but it's just so frustrating. No one should have to go through that! But it has been those kinds of attitudes, as if they're doing us a favor by keeping is down, that infuriated me.

When someone says 'you people', there's clearly some kind of blanket, stereotypical notion held about our capacity, and it was a very clear message about our intellectual inferiority... No one should have had to go through that!

There were other examples of racism that had to with language. English is my second language, but people forget that. At times when I express things in an awkward way, there's this reaction 'oh, it's because she doesn't really understand'. But it's not that at all. It's often what you do when you speak in a second language, you transpose certain structures of your first language into the second language, and it translates a bit differently. So, one may say things that in the structure of your first language are absolutely correct, but in the structure of the second language, it sounds a bit odd to people who have a very habitual way of turning a phrase – we don't even think about how habitualizing language is, especially within the academy.

I often argue that an ignored consequence of this standardization of language is a stifling of creativity. Years ago, I remember hearing about some research that concluded, the longer people stay within academic life, the less creative they are [all laugh]. Unless you work at maintaining your creativity, there's something numbing about the way the language is used, and the repetitive nature of it and the manner in which language is codified, so it becomes a thing rather than language as a living experience.

There are, of course, many different elements that feed into what causes these kinds of cultural conflicts, the tensions that stem from cultural differences. These experiences of cultural tension can arise for students, not from the dominant culture or the dominant class or gender, when they're working to achieve academically, like everybody else, within a context that feels unfamiliar or unwelcoming. You want to be able to continue your educational formation, but constantly feel like you have to constantly prove your worth and legitimacy.

Another example from my early 20s, was with a white female instructor in nursing school. As part of the nursing program, students had to do a case study about one of our patients. I chose to do my case study on a young Black male patient I was caring for who had a football injury and ended up paraplegic. I worked very hard to give him good care and to bond with him and his family. I was so proud of my case study when I turned it in.

Well, 20 years later, I learned from one of my nursing teachers with whom I ended up remaining friends, that there had been an issue with my case study. When the professors got together to make decisions about grades, they talked about students' projects. My supervising nursing instructor alleged that I hadn't written my case study, that somebody else had to have written it for me because it was excellent. And everybody said it was excellent. She simply could not believe I had produced this level of quality work. But luckily, I had one advocate, the instructor who ended up becoming my friend. She told me: 'I had to stand up and I had to say she absolutely wrote it. She's absolutely capable of doing that level of work'. And there was a whole lot of tension in the room. My supervising instructor actually wanted to keep me from graduating [interviewers gasp]. These are crazy discussions among faculty that often happen but students don't even know. I would have never known that this had gone on, had my friend not told me the story two decades later.

There are just so many ways in which students are racialized, how they are perceived and misperceived, because of how they look or because of their gender or economic status. Sadly, stereotypical attitudes that professors and instructors carry are often deeply embedded. They themselves are not always conscious of how they're manifesting them in the way they interpret and perceive students who they see as being very different.

J.R.: That's really shocking. But none of this could stop you from having an excellent education and doing extremely well along the way.

A.D.: I had three little children that I had to care for by myself. It was about the survival of my children and my own survival. Sometimes when people grow up affluent or when they grow up comfortable, they can't even imagine everyday survival as a motivating factor. But when you don't grow up that way, it is a motivating factor. Taking care of your children is a motivating factor, taking care of your family is a motivating factor!

J. R.: You were already a superwoman at a very young age and this is quite unimaginable and extremely admirable how you managed to do that.

A.D.: I think I'm just stubborn [all laugh]. I'll be damned if I let anybody get in the way of my learning and creating [all laugh]…to let anyone destroy my right as a human being.

TA.: Can we ask you a bit about critical pedagogy? In our analysis, you're one of the successors of Paulo Freire. You're a leading critical educator. Could you please sketch out for us what critical pedagogy is in your interpretation?

A.D.: Critical pedagogy is a school of thought that is derived from critical social theory. A principal aspect of critical social theory is a critique of capitalism. People often forget that that's one of the central tenets, in terms of the work of the Frankfurt School and so forth. Critical pedagogy asks educators to think about education and schooling in a more expansive way, rather than just simply about methods and curriculum. It's about comprehending that how we think about the world will ultimately determine how we teach about the world. It speaks to the importance of culture, how culture works, and how ideology is always at play in our interpretations of the world. And, thus, it is at work within the classroom itself, where cultural politics are always at work. We can't pretend that people somehow just get ideas out of a vacuum, without any sense of relationship or groundedness to contexts. All ideas of teaching are very much politically inspired; they have to do with how we view power and our view of human beings in the world, as well as our understanding of how resources should be distributed (or not distributed).

Critical pedagogy engages with cultural politics and economics, understanding ideology and critique as central dimensions to how we come to know the world, our capacity to question the world, and an understanding that there is always an ideological lens of values and beliefs at work. There actually is no sole individual perspective or opinion that exists. Often people want to hide behind an opinion, pretending an opinion is rootless, devoid of any collective worldview. The reality, whether we wish to accept it or not, is that we are all completely interconnected, and that the values of the society, the ideologies that are formulated and perpetuated within education or within the larger society, have a fundamental impact on how we perceive human beings, how we perceive the purpose of education, and how, thus, we engage with our students.

An important element of critical pedagogy, then, in the issue of critique; that is, our capacity to ask questions, such as 'what are the consequences, if I use this particular practice within my classroom?' 'Who does it positively impact?' 'Who does it harm?' 'What are the consequences of these particular materials?' 'What do we say and how does this impact students who come from different perspectives and different realities?' Essential to critical pedagogy is the educators' willingness and capacity to be present in the world; to be present in terms of their ability to reflect—to be reflective about their labor and to understand themselves as immersed within particular conditions and particular realities tied to relations of power. This is central to understanding

the nature of hegemony and how it is enacted within the context of hegemonic schooling.

Schooling as a social institution has a history, and it is a history embedded in privilege. The process of establishing schooling for working class children only came about when the capitalist class decided they wanted workers to have more critical skills so they could be better workers on the production line. This historical motivation for educating the dispossessed classes is often ignored in the formation of teaching, so teachers never have a full picture of what is taking place or the manner in which state policies and practices are determined, or who is implicated in the process of educational reform. The political economy, for example, is key to the kind of education that students receive. Within the context of critical pedagogy, state politics are considered important to understanding the limits at work in educational practices. These elements are central to understanding education as a complex institutional process, shaped by social and economic interests—generally of the wealthy and powerful.

Of course, in relationship to my work, culture and power are always implicated within the context of the classroom. How is power being structured? How are students being prepared to take their place—whatever that particular place is—dependent on their social location and how they are perceived by those who wield power? So, for example, the education of affluent students is very different than the education of students from subaltern, impoverished communities. It is very different because there's this understanding that affluent students are being prepared to lead the world [laughs], whereas the rest of the students are being prepared to follow and do their bit to perpetuate the status quo, to perpetuate the particular order of power, privilege and wealth that persists within society.

Critical pedagogy seeks to make explicit an understanding of how money and power are always implicated. Along with that, it seeks to cultivate and extend a dialectical understanding of the world. It pushes against positivist notions and fosters complexity in our understanding of the way that tension, in the context of human relationships, is at work all the time. And, more importantly, critical pedagogy promotes a view of tensions as actually being necessary to creative life. Hence, when we invest ourselves in trying to undo tensions, this undoing of tensions actually functions in collapsing our creativity and imagination. Tyranny is a great example of the total collapse of that creative tension with the context of fascism, so that those in power attempt to dominate and control in absolute ways. There's much rhetoric about traditional education supporting us as free thinkers. Yet, that is one of the biggest lies at work, because the conditioning that goes on in education is generally very formulaic, particularly within the schooling of working class and subaltern communities. The formation of students is directed along a narrow line of thinking, designed to gain their consensus, even when it moves against their own interests, maintaining the structures and practices of domination that negatively impact their lives.

Moreover, critical pedagogy asks of educators to understand themselves as intellectuals and cultural workers, as teachers who have the capacity to think and reflect and engage with their labor in ways that are meaningful to a political project of liberation. Rather than just being automatons who dispense instrumentalized forms of deadening curriculum, their practice should reflect a truly organic and grounded way of teaching, of relating openly with students about their world.

When, we as teachers, understand that schooling practices are not innocent, but rather reflect practices that often are anchored to powerful belief systems, material conditions and social contexts that perpetuate inequalities, exclusions and injustice, then how we approach our teaching is going to be very different. Our teaching is going to prepare students in much more complex ways. Students enter classrooms with all sorts of capacity to engage complexity, but the formation has to be one that brings them into critical engagement with their world, where that can reflect on how they come to be who they are. Even the things that they may think as truth that they believe in, they are encouraged to ask: how did they come to believe those truths? Questions like this are essential to the evolution of students' capacity for critical thought.

So often what we see in the process of traditional schooling is much attention placed on form or content. I'm not saying that those aren't important. But the truth is, we can have a form or content that appears to reflect emancipatory values, but pedagogically is taught in authoritarian ways. In such a case, neither the form or content will have transformative value. A transformative pedagogy must be anchored to a political project of emancipation within education that recognizes the relationships that exist between content, form and pedagogical process, and that all of those elements must be brought into play in understanding how we teach, how we interpret student needs, and how we engage the relevance of the curriculum to their lived histories. In contrast, within the context of neoliberal education reform, teachers are contending with very rigid and standardized curricular forms that reinforce passivity and compliance.

J.R.: What you're saying about the school is very interesting to me. I'm also influenced by the Frankfurt School of Critical Theory. I'm also very much reminded of what Foucault (1995) wrote about disciplinary power and schools having similar structures like prisons, and the purpose is basically to create docile and productive workers.

A.D.: Absolutely, and, for the most part, it's still that way. Even more confusing and disconcerting, within the so-called "third industrial revolution" characterized by the high digitization of work, is the move by the capitalist class to make workers obsolete. This doesn't get spoken much within educational debates, yet within the context of economic debates about the future such conversations are common. Greater and greater automation and less and less meaningful work benefits a very small, very powerful, wealthy, privileged sector of the society. The majority of society is yet to recognize the devastating implications to labor by this movement toward advancing the use of artificial intelligence. However, simultaneously in the midst

of the propagation of that discourse, we experienced the pandemic. People jolted out of the phrenetic context of capitalist production seemed initially confused and stressed, with a sense of loss of a meaningful existence, exacerbated by the fear of the virus spreading. More recently, however, an interesting dilemma is unfolding, as state proclamations of 'the pandemic is behind us' become explicit. Many workers now don't want to go back into the office, they say: 'Why do I have to go back to the office, if at home, I get as much more work done'.

Many workers came to enjoy the autonomy and freedom of working at their own pace, without being surveilled. There is no question, that we need more conversation about this issue, given that so many office workers, as well as teachers and nurses and administrators are quitting their jobs. Many are refusing to go back to the office, if they feel it's totally unnecessary because they can do their work more efficiently and better at home. Another power struggle then is beginning to take place, as people are choosing to leave work in corporations and industries. I was recently reading about the IT field, where many workers are resigning their posts, tired of unrealistic worker expectations, which prior to the pandemic were normalized and now are being challenged.

J.R.: The great resignation.

A.D.: I don't know if part of what's going on is that people have become aware of how entrapped they were and how imprisoned their lives had become by the capitalist culture of work; and now they are beginning to say: 'Look, maybe there's another way for me to survive, not having to be under the thumb of that' [laughs] – whether it's the corporate culture or the institutional structure. How people are responding seems to be challenging the authoritarian status quo nature of many institutions, including educational systems.

The discourse is very interesting because not everyone is resigning. Some people want to go back to the office or classroom, because they miss the social aspects of engaging with others. But other people feel that they actually have more social freedom and meaningful social engagement with other people when they're not in the office. I don't want to simplify this question, because it is complex. But we have to acknowledge that how people are responding is not just in a vacuum, they're responding to very real material conditions of production and structures of institutions and organizations that impact their lives in real ways. I think that there's more and more frustration around a growing culture of authoritarianism and diminishing opportunities for democratic life within institutions, including schools and universities.

J.R.: We are absolutely with you on that [all laugh].

T.A.: You are one of the great experts on Paulo Freire and you worked with him before his death in 1997. How was it working with Freire? What are your main takeaways from Freire's work?

A.D.: Paulo Freire was, indeed, an extraordinary person, no matter what critiques some people might have of him. In my experience, he represented one of those rare people capable of taking the experiences in his life – no matter what they were, even the most difficult experiences– and learning from them, bring the wisdom that those experiences had to offer, and integrate what he learned from life in his thinking about schooling and society. This was particularly so in thinking about questions related to oppression, inequalities and injustice. Paulo was a fun person to be with. I loved being with him, because there was a great wit about him. There was a real, genuine warmth, he was very honest and, he had an immense capacity for vulnerability.

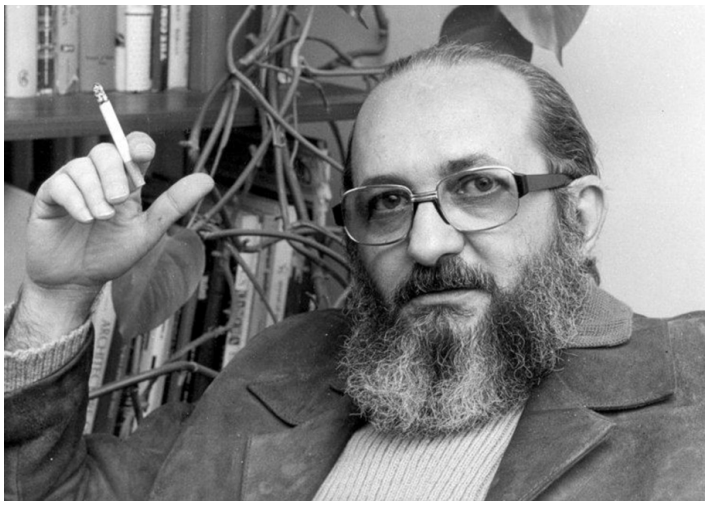

Figure 3: Paulo Freire (1921 – 1997). Source: Freire (2022).

Paulo was a fun person to be with, I loved being with him, because there was a great wit about him. There was a real, genuine warmth, he was very honest, and he had an immense capacity for vulnerability.

He had all those wonderful qualities that I admire in good teachers, in great activists, and in wonderful scholars; in that he had an expansive ability to engage with the world openly. And there was a deep sense of love about him. Love is a central quality for me. What I, particularly, learned with Paulo was how our capacity to love life, to love the world and to love others has such an essential impact on how we engage with our students and those we meet out in the world. You felt a warmth about him that was palpable. I remember one evening when we were at restaurant for dinner, how Paulo engaged with the waiter at the restaurant. In trying to decide what to eat, he said, 'oh tell me what you really like'. He was sincerely interested in what the waiter had to say. That's just how he was. Or something would come to mind and he would begin to converse about it to somebody on the street. People interested Paulo, he was curious about people's lives. And he cared deeply about the struggles and condition of people's lives. He cared about what others had to say about their own conditions of life and was thoughtful about how he could integrate their understanding into his own understanding, especially when they brought an element to his knowing that was not there before, an experience new to him. I would say Paulo loved to learn from others. His great capacity to teach others was

inseparable from his capacity to learn from them.

This, of course reflects one of the key features of his dialectical pedagogy of love, 'you can't genuinely learn unless you can teach and you can't genuinely teach unless you can learn'. The most amazing thing for me was his capacity to actually live his values. This was a man who truly lived his pedagogy. And, in working with my students and working with teachers, I always come back to the importance of living our pedagogy.

For Paulo, his pedagogy of love also required an openness to rethink, to reinvent. For him the world was never a hermetically sealed or dogmatic or sectarian conclusion. That's not the way he saw the world, he believed that we had to maintain an open-mindedness so that we could perceive all the opportunities that might be available even within limited situations. This, of course, refers to his notion of 'limit-situations' (see Darder, 2018a, pp. 130-131). Where even within situations that seemed limited, there are spaces, if we look, where we will find opportunity. This is part of our work as good educators, finding unimaginable opportunities, even within a situation that might seem very closed. By living with openness in our collective relationships with students and communities, we are going to create together greater possibilities for transforming the world—far more than if we come to it in a rigidly sectarian or dogmatic way, which only serves to reproduce the authoritarianism that is the product of injustice and abuses of power linked to the oppression that we find in the world. What is important here is that our pedagogical approach is as important as any subject matter that we teach. But at the same time, of course, we must be knowledgeable about our subject matter.

I think another thing that I appreciated about Paulo was that he was very clear that our teaching had to be more than just about processing content. We had to be able to engage with the very real conditions of students' lives and of our times; we had to be able to critically engage the curriculum. For through critically engaging the curriculum with our students, we're also involved in an important political process related to their critical formation within the classroom. So, if I have certain notions about what's going on in the world, for example, what's happening in Ukraine at the moment, yet I fail to engage honestly my students about what is transpiring, I'm missing an important moment for dialogue. This, of course, entails a loving dialogue rooted in openness, where other views can be brought to the table, so that we can discuss these ideas together and consider the consequences of our particular ways of thinking.

To not do this means losing opportunities to broaden the field of engagement within the classroom. Here, again, I loved Paulo's capacity to go into a situation and, even if he disagreed or there seemed to be a roadblock, he created an expansiveness of being through posing questions. A pedagogy of questions was another significant feature of his work. For often it's not by our laying out the critique or trying to make the interpretation ourselves, but rather by posing thoughtful questions that allow us to enter into genuine dialogue with our students, where we together can reflect on possible actions we might take and their possible consequences. Then, we come back, after we've taken action, and reflect on the impact of those actions, which often leads to new questions to be posed. Dialogue is a regenerating process, when it's done in a way that is open, democratic and purposeful. So, dialogue is not just a conversation; we're not just chatting it up with our students; we have a clear political purpose: to create humanizing conditions that support the dignity of students, their voice as subjects of history, and their empowerment as cultural citizens of the world.

> ***Dialogue is a regenerating process, it regenerates itself when it's done in a way that is open, democratic and purposeful.***

There was never any question that education for Paulo was part of a larger political project. The evolution of social consciousness then is a political process: we don't become conscious in and of ourselves. Consciousness is a collective or shared phenomenon; we develop social consciousness within community.

It was very difficult to be in Paulo's presence for any length of time and not find yourself actually feeling a sense of expansiveness, of more possibility. I think he understood that the worst thing we can do when we're dealing with issues of oppression, when we're trying to transform difficult conditions, is to get locked in into a rigid posture that entraps us, so we don't have anywhere else to go but to take an authoritarian stance. We're going to feel far more vulnerable when we've trapped ourselves into a dogmatic position, than when we cultivate a more fluid and expansive way of thinking about the world; particularly when we reflect on policies and practices of schooling and their impact on students and their communities.

> ***It was very difficult to be in Paulo's presence for any length of time and not find yourself actually feeling a sense of expansiveness, of more possibility.***

J.R.: You taught with Paulo Freire together and you had various encounters with him. You also talked about this before that you had a clash with him?

A.D.: I wish I could have had many more encounters with Paulo. For instance, Donaldo Macedo, who translated several of his works, had many more encounters with him, as did Henry Giroux and Ira Shor. However, my moments with him were always very rich and memorable. For example, we had one of those moments at a small conference. I was much younger, we're talking now about 40 years ago. There was this discussion about tolerance. I think the hardest thing for me was feeling alienated by the way some were discussing the issue of tolerance. The question on the table was something like: 'what does one do in a seemingly liberal situation where some of the behavior or the actions taken are actually racist or sexist and thus, unjust?' My position was adamant, we should absolutely be intolerant of injustice. Paulo, concerned by the tone of the discussion insisted that we, as educators, needed to be parsimonious with our words in such occasions – I remember he used the term 'parsimony'. This concept was not easy for me, in that I can be very fiery, especially when I'm feeling very frustrated.

Over my life, I've come to recognize that I carry collective anger as a colonized person; collective anger and rage as a woman trying to contribute to the world and yet constantly dealing with men who had to validate me, before I could be seen as legitimate. I've not been very friendly [laughs] in such circumstances, to say the least. Anyway, on one occasion, I was pretty upset with the manner a well-known critical male comrade was speaking to one of our female colleagues. Later, I was trying to explain to Paulo why I had become so upset. He said a few things that made me feel he wasn't quite on board with my reasoning. I really pushed back. Then, I remember him looking closely into my eyes and saying, 'Oh, Antonia, one day you're going to be a great intellectual' [laughs loudly]. When I think back, I realize that I was still pretty young and naive. But I think what he was trying to say is that he understood the 'fire in my belly' and why I felt as I did. But at the same time, that wasn't going to be enough, if I wanted my work to make a difference. The 'fire in our belly' is not enough, if we want to bring about social change. We also had to be able to have conversations across the table even with people who we disagree with; because otherwise all we would do is fight or argue, or even enact a sort of violence by our words. These are not Paulo's words, but my interpretation of what I think he was trying to say to me, when he said we had to be careful with our words, in that our speech also has political consequences.

Over my life, I've come to recognize that I carry collective anger as a colonized person; collective anger and rage as a woman trying to contribution to the world and yet constantly dealing with men who had to validate me, before I could be seen as legitimate. I've not been very friendly [laughs] in such circumstances, to say the least.

Nevertheless, one of the things that I understood and that I often speak about in my work is that Western epistemology, in which most of us have been socialized, is an epistemology of conquest. And that means that a culture of war is central to how we have been conditioned to understand and interpret the world. It's central then to the culture of schooling, the culture of the university, and all Western institutions. The culture of war is embedded in the hegemony of the culture industry. I say this because it is the only way we can understand the logic of a citizen formation willing to accept war as a "democratic" solution, even as a solution for peace. When you consider it philosophically [laughs], there's a big problem there. As long as we continue to be epistemologically wedded to a culture or an ideology of conquest and domination, we're going to have a very difficult time transforming this world into a true reflection of a lived justice and equality for all.

J.R.: I think tolerance is really one of these seemingly contradictory concepts…

A.D.: or paradoxical at least [laughs]

J.R.: …paradoxical may be a better word – because I also think it's very important to listen to the other side. But at the same time, of course, we must never become tolerant of oppression…

A.D.: That's right!

J.R.: As some of the philosophers like even Popper (2020), and especially Marcuse (1969) said: it is a recipe for disaster to have pure tolerance because then the tolerant will be destroyed by the intolerant and all we will have left is repressive tolerance (rather than liberating tolerance: Marcuse, 1969).

A.D.: I'm absolutely with you [all laugh]. We should never be tolerant of policies and practices that serve to dehumanize and strip away our dignity and the dignity of our children.

J.R.: You wrote an excellent *Student guide to Freire's pedagogy of the oppressed* (Darder, 2018a) that I had the pleasure to review in the *Journal of Applied Learning & Teaching* (Rudolph, 2021) and it focuses on this landmark work that Freire published from around 1970. Among many other scholarly books (I think it is a total of at least 11 that you wrote), you are also the author of *Reinventing Paulo Freire: A pedagogy of love* (Darder, 2017). How is practicing critical pedagogy different in the current context compared to when Freire was writing? Because I think Freire was always saying 'oh, you cannot just copy my work, but you must reinvent it in your own context'. What elements of Freire's theory are still relevant and what elements might we question?

A.D.: The particular context in which we practice at any time, even in the same era, will have a great deal to do with our approach; because the context gives us important information about what interventions we need to make, what issues need to be questioned, how we challenge inequalities, and also the consequences our own efforts may have as well. It's hard for me to say 'well, it was easier then or now'. We've been consistently immersed in a profoundly colonizing culture, and we still are. With time, it may become more sophisticated in certain ways or more nuanced in other ways, but it is a colonizing and dehumanizing culture, nonetheless. It is a culture that is 'anti-life' – anti-life rather than 'pro-life', and I don't mean that in the religious sense in any way, shape, or form; a better word here is 'life-affirming'; Freire was about the struggle for a life-affirming culture, where we fight to build contexts for people to be able to be creative. Our curiosity, imagination and capacity to be creators is central to what it means to be a human being in the world. When we think of what oppression does to people, it squelches our creativity, imagination and our birthright to be creators of our own lives. I think Freire understood this and, in many ways, his pedagogy places a great deal of emphasis on supporting students and communities to cultivate their creativity and their epistemological curiosity. His pedagogy of love is about creating a space where students have the dialogical space to question traditional epistemologies and think them through; by doing so, they have the opportunity to rethink their own lives and understanding of how things in their lives and in their communities came to be as they are.

A very relevant dimension for me is that we must acknowledge that Freire was unlike most theorists. What's particularly amazing about Freire is that he wasn't a method. And the reason why he remains relevant to this day is that his pedagogy encompassed principles of engagement, principles of thought, and principles of teaching that were not recipe-bound. He spoke often about reinventing, because he understood that every context will have its own set of formal and informal power dynamics, the culture of the context is going to configure relationships among participants in different ways. When we enter into any context, we have to understand this and we, as such, have to be willing to engage with the histories of the people who are there. In the classroom, it requires a willingness to engage, in serious ways, with the lived experiences of our students.

One of the biggest problems that we find within traditional education is that there's this notion that somehow the student is an object (rather than a subject), an object to be filled, as Freire argued. So, teachers are seldom concerned with students' lived histories, they're not prepared to be concerned with students' bodies, their emotional sensibilities or cultural understandings. The students themselves become conditioned, within an instrumentalizing context, to see themselves as objects. One of Freire's greatest contributions is his effort to breakdown and conceptually dismantle a pedagogy of domination, what he called 'banking education', because it is essentially an authoritarian pedagogy, one of indoctrination and one of ideological brainwashing, in a lot of respects—although most people would not want to look at it that way. But in fact, that's exactly what it is.

Often, I think about the ways in which curriculum gets created, especially in the early grades. There is the standardized curriculum teachers are supposed to teach. In the first grade, you're going to teach ACB, in the second grade XYZ. For each semester, there's an outline, chronologically developed, about what you're going to teach. Well, if a child asks a question about something in the curriculum that isn't coming up until next year, what the teacher often does is to shut the student down or give them some very nonsensical answer; rather than saying 'Well, let's look at that', engaging the students in whatever comes up. Sadly, there is more of tendency to say, explicitly or implicitly: 'Oh well, you're out of order in your learning'. So that response is meant to shut them down and bring them back to the prescribed curricular script. 'Oh, no, we have to study whales today. We're not studying ants. I know you want to talk about ants today. But we don't study ants until next year. We're studying whales today'. Of course, I'm saying this in a bit of a facetious way here. But this example is from an actual classroom moment that I witnessed and thought: 'Oh my goodness, the kids were so excited about those ants that they were watching out in the school yard today and it was such a wonderful teachable moment'. But the unit on ants was not going to be taught until the next year! By then, they may have lost all interest in ants. What better time to engage kids that in the moment, when they are organically experiencing the topic of study?

Consequently, knowledge in schools (particularly working-class schools) often becomes very fractured, fragmented, instrumentalized and objectified, rather than being an organic process. In teaching, we're engaging with children and students who are learning how to engage with their world. In the process of hegemonic schooling, students are socialized to think about the world in ways that are fragmented and instrumentalized, rather than in ways that are integrated and organic.

Freire was very much about engaging with actual experiences of life and embracing teachable moments. He was about engaging with the lived experiences that students brought into the classroom. His notion about where we start – whether we are working in communities or in classrooms – we start wherever the students are at; not where we, as teachers, think they should be. We need to understand that learning is an organic and evolving political process, that we evolve dialogically and democratically together as we learn and work together. In this sense, Freire's pedagogy is powerful!

Of course, the issue of love is a very important aspect of his pedagogy. Because to teach with love means that you have faith in the students' capacity to contribute to their learning, to be a central part of their own learning; that you have a certain willingness to remain open in terms of their capacity to engage their world; and that it's a process in which, as they're talking with each other, they're actually learning to be in dialogue. As such, there's learning that goes on, not just from what the teacher brings, but from the dialogue that's going on among the students themselves.

The unfortunate thing here is that this form of pedagogy, a dialogical pedagogy, is often seen as a lesser pedagogy within the traditional context of schooling. Moreover, when students have been educated in a very traditional, unidirectional kind of banking education and they enter into a classroom informed by a dialogical pedagogy rather than the banking form, they often feel very uncomfortable and disoriented. In the traditional context, they knew what to do—acquiesce and regurgitate the teacher's expectations. But, all of a sudden, in a dialogical context, they're being asked to be co-creators of the knowledge, to be co-creators of what everyone is learning together. And it can be a process where the teacher requires love, faith and patience, as students develop their ability to reflect, to voice their ideas, to engage with one another in meaningful ways, and to consider together the consequences of their learning within their own lives and the world.

Sometimes students will resist, but that's also just another aspect of critical pedagogy, where resistance is considered an important aspect of developing critical thought. It's a necessary part of students' learning. If we understand resistance is a necessary part of life, then as educators we can embrace and engage the resistance of students in ways that support their empowerment and their evolution as cultural citizens of the world. Embracing students' resistance ignites powerful forms of knowledge that can surface and evolve in the process of teaching. We need to respect resistance as a meaningful human response. What's funny is that sometimes, critical pedagogues who try to be very Freirean get very upset or very disappointed when kids in the classroom resist [all laugh]. Yes, engaging student resistance may take a little bit of time because you've got

to stop and remember students have been socialized to learn traditionally in a very different way. So, we're asking them to let go of what they thought they knew and to enter into learning in a very different and unfamiliar way. Here, our capacity as educators to be patient with accepting the discomfort and the dissonance that students feel, when we're creating a critical pedagogical context, is central to our labor. We're not giving students their voice. We are not empowering students! No! We're creating the conditions within the classroom where they can access and develop their own voice and empowerment. Such conditions must also be understood as part of practicing democratic life. There is no question that Freire was very much about a living and embodied democracy. These is a significant aspect of his work that remains tremendously relevant to our work in education and communities today.

J.R.: I completely agree.

A.D.: Actually, there are so many aspects of Freire's work that remain relevant. His belief in our own capacity as educators to bring a sense of wonder to our teaching; and to understand that within that wonderment, there is an expansiveness that is possible and necessary to our formation as empowered and joyful subjects of history. Freire often said, no matter how difficult our labor might become, we should never lose our capacity to have wonder about the world and to engage one another in more lively and humorous ways. Although he was, of course, a serious scholar, Freire was jovial and funny in his own way; he brought his own sense of humor to his teaching.

An important point to make here about dialogue is that it is a way of learning that can't be done alone. It's a way of learning that must be done in community. We learn together because together we go further than if we go alone – there's an African proverb: 'alone, you go fast, but together, we go further'. His work was so much an integration of that understanding. And how we do that best is that sometimes we must be willing to move a little slower, when our fellow learners or comrades need a bit more time to reflect, voice, and make sense of the conditions we are engaging. In this sense, Freire advocated the need for humility and consideration to temper any inhumane tendencies to act out the authoritarian conditioning we may have internalized from our hegemonic schooling.

Of course, Freire's way of teaching is not popular within efficiency-driven modes of education. In a factory-like approach, dialogue is not considered welcome because it's seen as a very inefficient, undisciplined, and time-consuming way of teaching. But the truth of the matter is that, in my experience, by taking more time, being organically engaged with students and creating the context as an educator for the formation of voice and participation through critical dialogue, what you get is very meaningful forms of learning. For example, I have completion rates of 99% of all of the doctoral students I've worked with over 30 years, and I have had five to eight doctoral students graduate, yearly, since the '90s.

J.R.: Wow, that's amazing!

I have completion rates of 99% of all of the doctoral students I've worked with over 30 years, and I have had five to eight doctoral students graduate, yearly, since the '90s.

Figure 4: Antonia Darder with her doctoral graduates in 2014.

A.D.: What's been so frustrating for me is that, although I've been very happy to talk about my approach with doctoral students, often other colleagues don't care to hear it. How I have accomplished this is by living my understanding of Freire and embodying it within my own work. When we create the opportunity for meaningful formation and meaningful learning, students will learn. Often, I would have students come in thinking they had to do a dissertation based on very traditional expectations. So, I would ask them a series of questions: 'Are you excited about that topic?" [interviewers laugh] 'Is that what you're really passionate about researching?' 'Well, what are you passionate about?' Sometimes it took a little while for them to figure out what they were passionate about. But I would not let them move forward, I simply wouldn't, until they could align their true passion with their dissertation work. And here is precisely where we, as doctoral supervisors, have an opportunity to use our authority in ways that are truly emancipatory; truly in the interest of our students' development, both in terms of the formation of their political consciousness and their academic development as critical researchers and writers.

I would have students, for example, that would come to me who had trouble writing. They would say: 'Oh, I have so many problems writing'. What I found was as soon as they started to write about things that were truly meaningful to them, their writing developed and evolved quickly. Many times, other colleagues couldn't recognize the student who had come in three or four years before and who that student was at the end of their dissertation process; because there is something powerful about writing about things that mean something to us, that we care about, that we are passionately committed to. I think that one of the mistakes that we make, in the way we engage students, is that we don't give them enough respect; we don't respect the things that they want to learn. As a consequence, university students are shut down. Yet, despite the fact that some of my former students came in with writing difficulties, many of them have now published books.

There is something powerful about writing about things that mean something to us, that we care about, that we are passionately commitment to.

J.R.: That's amazing!

A.D.: Yes! But it's not magic. It has to do with engaging students respectfully and expecting from them meaningful work; expecting them to respect themselves as thinkers, as people who are involved and who are creative. In the process of mentorship, there has always been a process of co-creation going on—which, of course, evolved over more than 30 years. I would say to students: 'I'm going to be here for you, wherever you are, I'm going to read your work as many times as I have to read it; but you're not going to move forward until it's really saying what you want it to say'. This level of commitment is part of what we need within universities, particularly with working class students and students from subaltern communities. Yet, sadly, often what I find is that many professors love to talk about critical pedagogy as philosophy or the theory, but in terms of how they mentor students, they are unwilling to put in the hours it takes or to be dedicated and committed to those students throughout their academic formation and beyond. That's what it takes, that's what should be done. If we are critical educators who believe in emancipatory political principles of education, that's our job: to create community with our students as part of our larger political project.

It's frustrating to see university students who are struggling suddenly get lost in the shuffle. I've spoken to graduate students who were going through a doctoral program that either felt completely lost or they felt that the professor was attempting to make them do the kind of research that the professor thought they should do, not necessarily what the student wanted to do. But then students would acquiesce and accept to being in a very instrumentalized relationship with their supervisor. It's like 'okay, I guess this is what I have to do to get through'. I don't think that we can build activist scholars in that way. I don't believe that political consciousness can evolve in a context where the student lacks agency and the power to decide the destiny of their own research and their life's vocation.

For me, the dissertation process is a political process of building consciousness. We're wanting students to engage with issues that are significant to them, so that when they go out in the world, they have something to say and something to engage with real importance. I'm not saying 'oh, it is important because I think it's important'. No, it's important because it is meaningful and materially grounded in the world; it's grounded in the material conditions and social realities that students are working in and living in. This is absolutely essential, in terms of this work. I just don't know how to do it any other way. But I feel a sense of comradely love with my students. In fact, I'm still in touch with the majority of my students; these are relationships of solidarity. It's not just for the few years they are students. When they finish their degree, they know they can still call me at any time. There's this sense that they are a part of a larger community of love and struggle, which expands in the process of our working together. And all this has to do with living and embodying a pedagogy of love.

J.R.: That's so impressive. Normally, the attrition in doctoral programs is as high as more than half, so that's so inspiring.

A.D.: Yes. Yet, sadly, as I mentioned before, when I try to engage professors about this issue, given the competitiveness and posturing of university culture, it just seems as if they don't want to hear it. They'll remark, 'I know how to supervise a dissertation', yet their attrition rate is dismal. It is truly disheartening to want to collegially engage on such an important issue and to have little to no positive response. This is one of the saddest things about an institutional culture of so-called expertise. Often folks espouse to wanting inclusion and social justice, but continue to practice a culture of domination. As such, if you're not vigilant about your participation in a culture of domination, you will begin to echo that culture in your attitudes and your preferences and your relationships. It is a powerful dimension of collegial work that often doesn't get engaged in the formation of doctoral students, many who will themselves eventually be professors. I think we have a responsibility to live and be the kind of professor that invokes through our practice an emancipatory vision of the world. Students need to see this is possible, because how can they know it's possible if they don't see and experience it in an everyday, living form? The contentious aspects of it, the struggles and tensions, all of it. We have to be willing to be with our students in all that it entails to be committed to democratic life.

J.R.: Modeling is so important, and you are providing your doctoral students with a model. They can see that it can be put into practice, and then they can practice it in their own teaching career.

A.D.: It's more about coherence and integrity. We all struggle. It's not easy being honest and open about our own struggles, to live this pedagogy of love with them. But it is precisely in that context that we come together to understand why we need solidarity and why we need community to continue this work for life.

T.A.: Just now you were already creating the perfect segue for our next question about your own teaching practice. You have perhaps answered that largely, but may I ask, what is your take on the lecture? Freire appears to have changed his mind about the lecture along the way. He was first perceiving lectures as banking education, that's obviously very bad, one-way traffic and so on (Freire, 1970). But later he said lectures can be good. And discussions can be bad, dialogue can be bad under certain circumstances (Freire & Shor, 1987).

A.D.: I like that question, because I think it really pushes us to understand what criticality is all about. How do we engage critically with dialogue? How do we engage critically within the classroom? So what Freire talked about was that directive aspects in our pedagogy are not a bad thing in the sense that often if we're teaching a particular subject, part of what the students have to learn are the basics.

Figure 5: Antonia Darder giving a lecture.

Even if they're going to challenge a way of thinking, they have to learn the basics, the key aspects of a topic or an issue. Whether it's political science or mathematics, there're underlying principles that inform the curriculum. These must be taught and, as Freire very much argued, we need to teach the hegemonic curriculum, but we must do it critically. In doing so, at times there may be a directive element, but for our teaching to solely be directive is another issue. When we engage with material presented in a directive way, it can't stop there. The material needs to be turned upside down by creating the space for dialogue. 'How are the students engaging with the material? What questions are they asking? How does the material compare to their own life? To their own cultural histories? How would it be perceived in their communities? Through question posing, we create a place for students to enter into the dialogue from the familiar, so they can move from their own world to engaging the less familiar.

It's a sense of our capacity, as teachers, to engage dialectically with a directive approach and a dialogical approach. We need to understand that there's actually a dialectic that can be found there, rather than collapsing it and saying it's either directive or it's dialogical. If we lose the dialectic, we lose the actual tension that exists and curtail the possibility of more creative engagements. In a context, for example, where students have to take standardized tests and pass them – otherwise they're not going to have access to educational opportunities – it doesn't mean the material for the test becomes all we teach. Instead, we want students to learn the material to pass the test, but we will also want them to be able to engage critically with that material, in ways that allow them to both co-create and transform knowledge in ways that make it more applicable to their own lived experience of the world.

The only way to engage critically, then, is to create the kind of democratic context grounded in dialogue, where students' voices can be heard. With dialogue, community happens that is meaningful and engaging, whatever the topics or issues are. So that's how I understood it. Again, Freire would never collapse it as either lecture or dialogue. The moment that we collapse anything, what ends up happening is that we then can get very dogmatic and express a very authoritarian attitude, which actually betrays our own emancipatory vision of education.

T.A.: Your books and articles form an extremely impressive body of work. Could you walk the novice reader of your work through what you yourself would regard as some of your key works and intellectual development? What are some of the changes and constants in your theoretical approach?

A.D.: Oh my, that's a very big question. My work begins with looking at what I called earlier 'the bicultural experience', and what I now tend to call the 'subaltern experience' because it provides a more extensive engagement with the issue (Darder, 1991). But what I was initially looking at was: the experience of students who grow up in a context where they're seen as the other -- where their culture, their language, their sensibilities are not at the center of the culture of schooling? What is the impact of that, in terms of certain crises, moments of dissonance and struggles that students experience?

The best way I could think of approaching the issue was by engaging the dynamic of culture and power in the classroom. My scholarly work begins with cultural power in the classroom and how different political decisions impact schooling, that is, liberal positions and more radical positions versus conservative positions. How do these ideological perspective fuel the culture of the classroom? How were these positions contested? How did the cultural reality of the students themselves clash with the dominant cultural position?

To me, this was an important issue, given that there were conversations taking place about biculturalism within Psychology and some in Education. But what was missing was a political-economic understanding of a subaltern positionality and the impact of that positionality upon bicultural students from the standpoint of their own oppression and domination. The issue of cultural differences was very much part of the conversation that was going on at that time. I was trying to sift through elements: how did that come into play in terms of testing? How did it come into play with respect to language instruction, bilingualism, and other linguistic concerns within the classroom? How did the culture of the teacher impact their own teaching, especially if they were teaching children that are not from their same culture of origin? What did teachers need to understand about how culture and power are at play in the classroom? What was the experience of bicultural teachers, who were Black, Latino or Asian in the U.S. – who were coming from cultures that were 'othered' within the United States? How did they engage with their own teacher formation – as again, there was a very dominant culture that they were being asked to step into? In many ways, bicultural teachers and students are asked to put aside their own knowledge,

their own cultural histories, their own linguistic knowledge, and the wisdom from their communities. So, I worked to examine these questions and the impact these issues had on teachers (Darder, 1991).

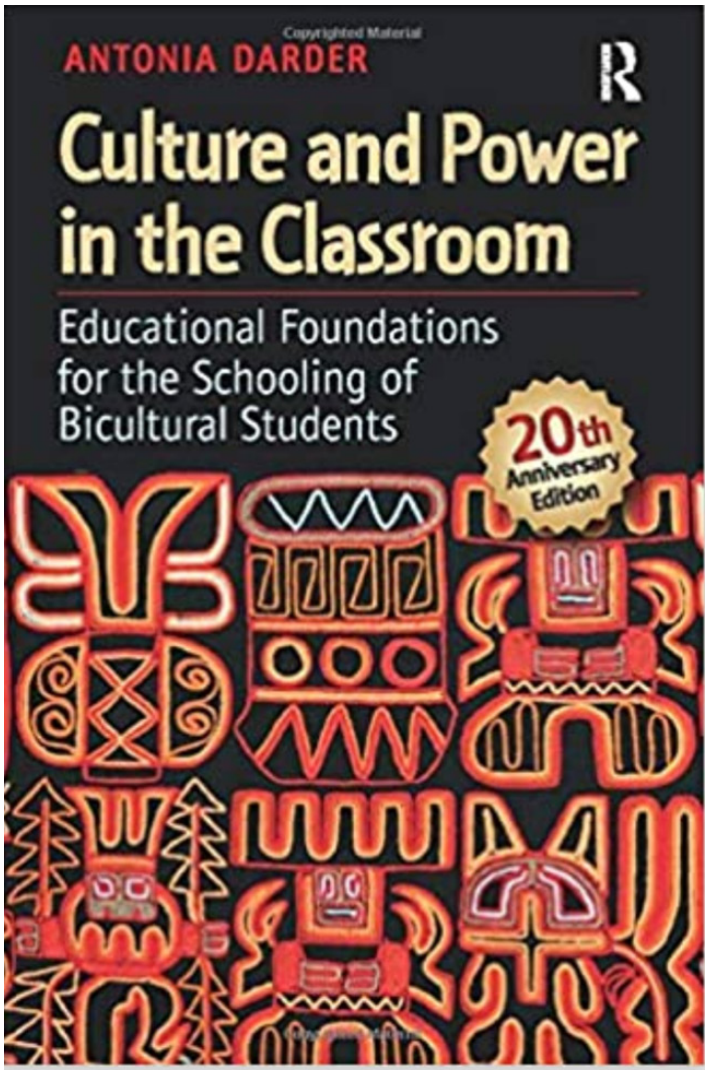

Figure 6: Antonia Darder's *Culture and power in the classroom* (1991).

In addition, with my good comrade, Rodolfo Torres, we looked at issues of 'race' and racism (Darder & Torres, 2004), drawing on Robert Miles' (1993, 1989, 1984) work. We argued that we couldn't understand racism outside of understanding political economy; and there had to be a critique of the totalizing impact of capitalism on societies. We posited that racism or sexism or any form of inequality actually serves to perpetuate capitalism and to maintain an unequal structure of power and wealth. Rather than to commonsensically perpetuate the notion of 'race relations', we wanted people to imagine that perhaps the notion of 'race' needed to be more critically interrogated. There's no question that racism exists because we see the impact of its racializing processes on students, their parents and communities. But often people surmise that because racism is real, so is 'race'. Yet 'race' as a social construction emerges out of a very particular history of oppression and colonization. The construct then exists within a contested domain. Many refute this particular way of looking at 'race', but for us, it was an important question. Moreover, we argued that we had to understand racism as a plural phenomenon. That is, we had to understand, for example, the conditions of the Irish, for example, in terms of their history of racialized oppression due to centuries of English oppression. The Irish, for example, were similarly racialized in England, just as the Irish and other immigrants were racialized in the U.S.

J. R.: How the Irish eventually became white…

A.D.: Yes, they were later racialized as part of the dominant white 'race'. But to understand how they and others were racialized, we needed to create a more extensive understanding of racisms and racialization rather than thinking of 'race' just in a black-white binary. So our work was also about trying to push against and dismantle that binary (Darder & Torres, 2004). In many respects we felt this was an important groundbreaking work, but an understanding that was beyond where most scholars were willing to go. This work remains highly critiqued, particularly by critical race theory (CRT) folks, for whom 'race' is the central unit that drives their analysis.

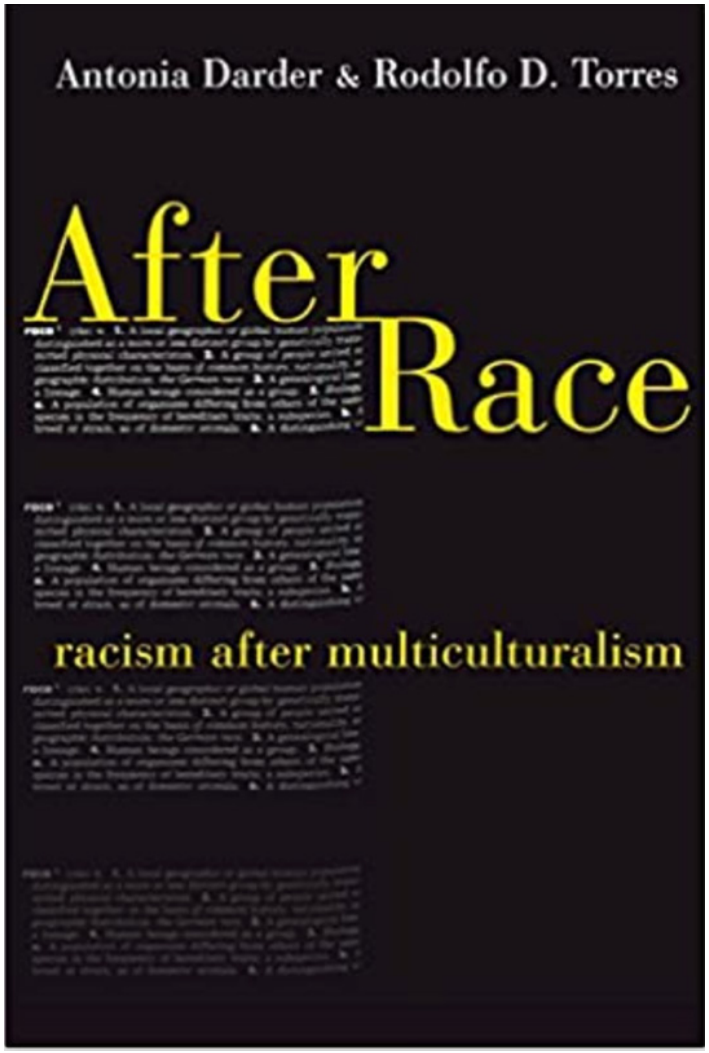

Figure 7: Darder & Torres' *After race. Racism after multiculturalism* (2004).

Another project that I was involved with (with Rodolfo Torres and Marta Baltodano), was *The critical pedagogy reader* (Darder et al. (Eds.), 2003), which is now going into its fourth edition. We wanted to develop a text that engaged the different issues and questions that were significant to critical pedagogy, so that students, teachers, and researchers working to examine these issues and questions would have a resource that could assist them in gaining a better sense of the complexity and multi-dimensional nature that is the critical pedagogical school of thought. And as we had hoped, over the last 20 years, the volume has made a significant contribution to the study of the field.

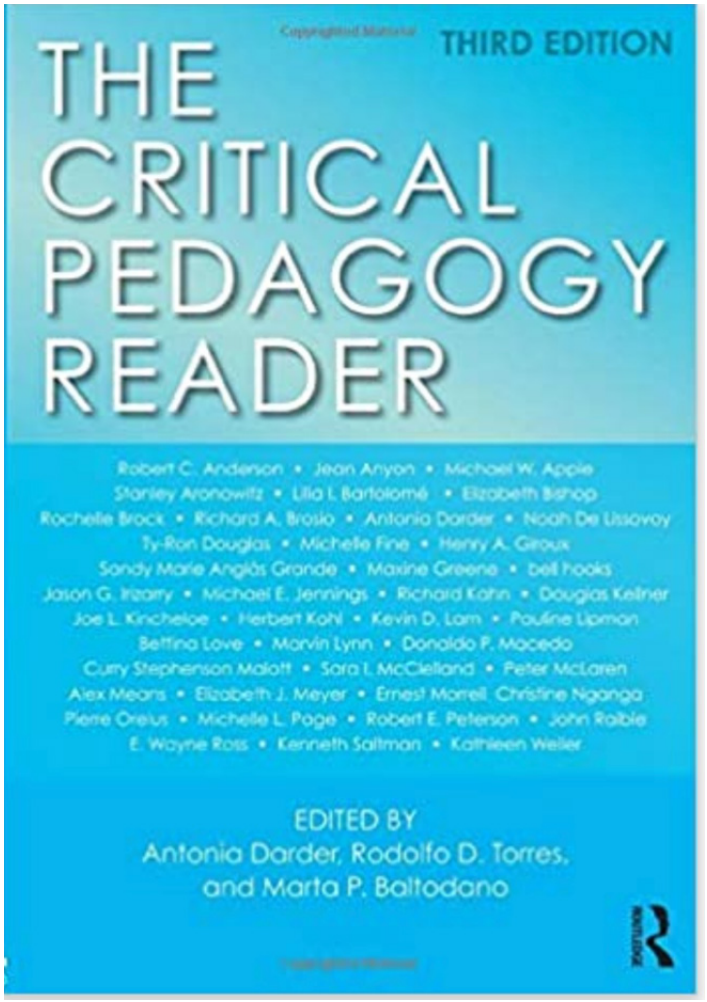

Figure 8: Darder et al.'s *The critical pedagogy reader* (2003).

Another area of scholarship was an effort to begin codifying the evolving area of Latino studies in both education and the social sciences. Our work produced the first *Latinos and education critical reader* (Darder et al. (Eds.), 1997) and the first *Latino studies reader* (Darder & Torres, 1997). This is an example of how my work moved across different scholarly arenas, beyond education. I see this multiplicity in my scholarship as a necessity for the philosophically interrelated understanding I bring to my work, which seeks to understand how issues of culture, language, politics, popular culture, political economy and history are all having an impact on how we understand the world. In order to understand, for example, the oppression of Latinos in the United States—that is, the oppression of Puerto Ricans, Mexicans, Dominicans, Latin Americans, Chicanos, etc.—it was important to understand how different histories and experiences of our presence in the United States. We wanted to highlight some of the differences and similarities that exist between communities as a consequence of how Latinos (or Latinx) populations were positioned as 'the other', in comparison to those who were not.

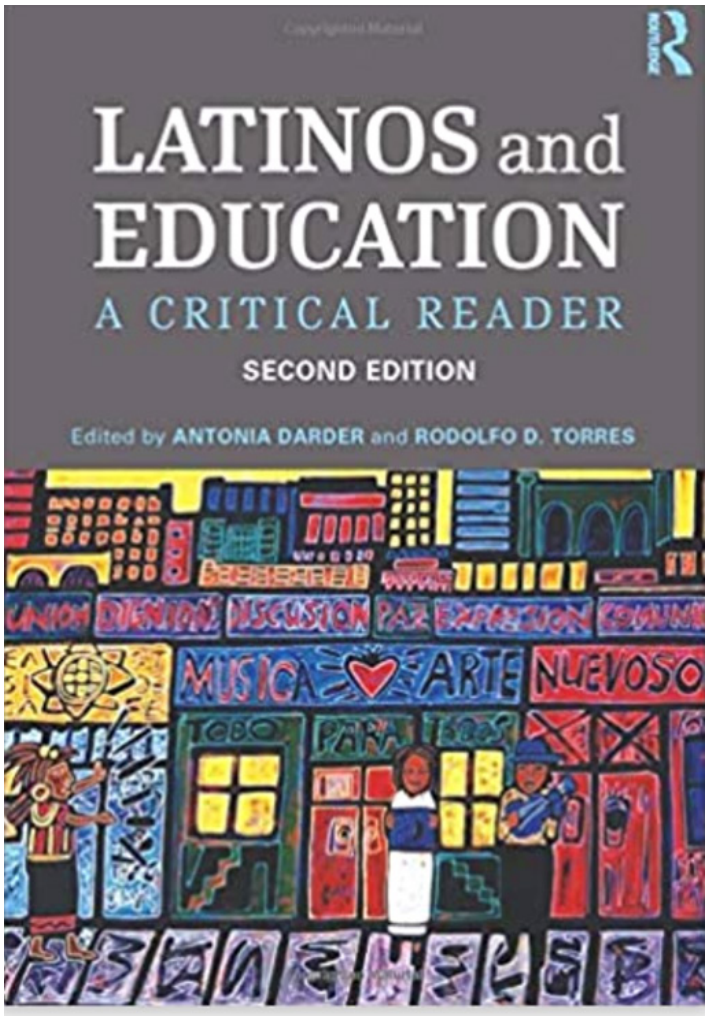

Figure 9: Darder et al.'s (Eds.) *Latinos and education. A critical reader* (1997).

My work has always been trying to articulate the importance of Freire's work within the classroom and the importance of understanding his ideas in deeper ways.

My work has always been trying to articulate the importance of Freire's work within the classroom and the importance of understanding his ideas in deeper ways. For example, *The student guide to Freire's Pedagogy of the oppressed* (Darder, 2018a) was a logical outcome of my concern that students reading the book gain a better understanding of the manner in which Freire's own lived history and intellectual traditions informed his political project. Often, what I found is that when students first read *Pedagogy of the oppressed* (Freire, 1970), many would struggle to understand the book. What I had hoped to do was to create a companion text, from whence students could begin to better understand how Freire's ideas are linked to many other scholars, philosophers and theorists of his time. For me, this was important in that readers had to understand that for all of us there's an ideological architecture to our philosophical perspectives, we

all have lineages of thought that inform how we understand the world and these inform our own scholarly work. Freire didn't come up with these ideas all by himself. No one person ever truly comes up with anything in isolation; we are all a historical compilation of many different thoughts and different approaches to understanding and making sense of the world. How Freire came to make sense of the world is not just solely by himself, it was Freire through his experience and Freire through all of his many readings. As he read, he would try to engage different perspectives and think about how different authors helped him to make sense of what he was experiencing. So that was what informed my purpose for that book.

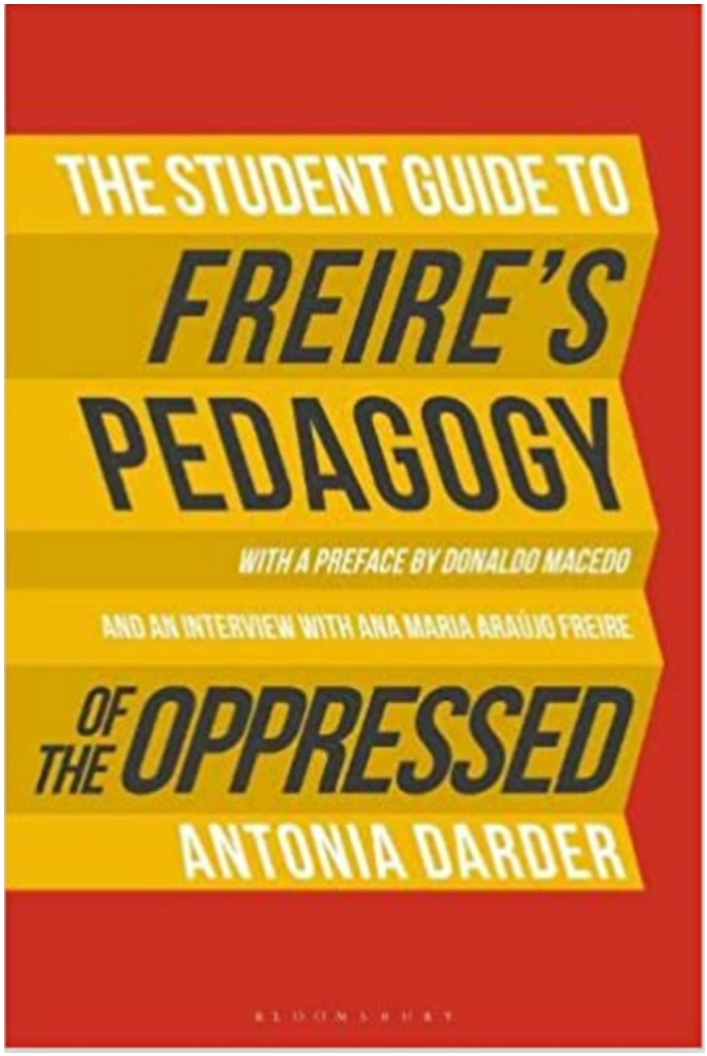

Figure 10: Darder's *Student guide to Freire's pedagogy of the oppressed* (Darder, 2018a).

I've also done some work related to examining decolonizing methodology in terms of interpretive methodology (Darder (Ed.), 2019). I wanted to focus on anticolonial or decolonizing research considered to be more philosophical or theoretical. It is often not acknowledged that there is a decolonizing methodology for the ways in which we build our scholarly texts, the questions we ask, and the kinds of issues that gave impetus to our thinking and to our theorizing. All of these aspects of my research, I have carried out consistently with a strong and deliberate sense of groundedness within the actual conditions in the streets.

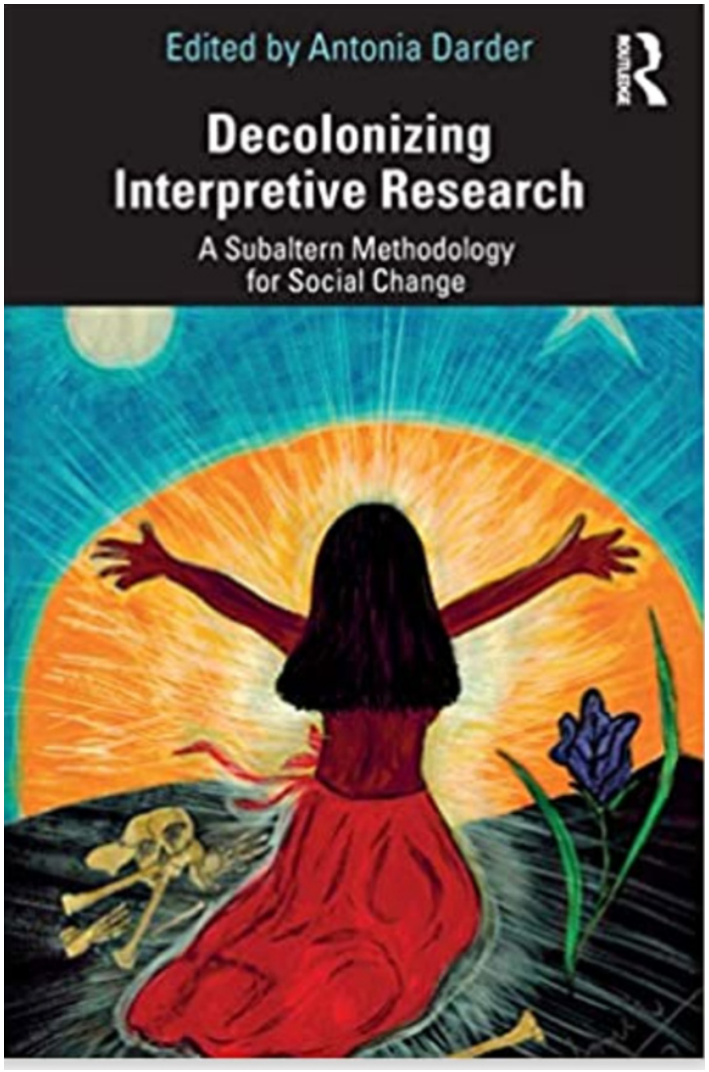

Figure 11: *Decolonizing interpretive research. A subaltern methodology for social change* (Darder (Ed.), 2019).

In the decolonizing interpretive methodology book (Darder (Ed.), 2019), I set out the theoretical elements in the first part of the book, then I included five examples from five of my former doctoral students who wrote about their use of the decolonizing interpretive methodology and how they built their research from this approach. I designed the book in this way because I felt that would be the most powerful to show how the methodology is lived, how it's applied and how it has been engaged within the context of educational research. I think in many ways, my work has always been linked to my efforts to bring to light the legitimacy of engaging subaltern views and perspective that so often many people want to discard or marginalize. This has entailed looking at experiences in the margins and trying to bring them into a more central position. Then from there, thinking about both epistemological and methodological questions in terms of Freire's notion of ethics and what it means to be anchored to an ethics of liberation. How do we understand it in terms of a living ethics—a living ethics by which we teach and struggle politically?

I've always believed that to change the world, there had to be an intimate relationship between what we say and do; between our ethics and our practice. We simply cannot live coherently if we are one way in the classroom, and then we

go out in the world and are something else. As Freire and others have argued, coherence and integrity are essential to our work as activist scholars and researchers. Of course, hopefully both qualities continue to mature as we get older and more experienced [laughs]. It is so important for us as professors to be clear examples of this kind of a living politics, this kind of a living pedagogy.

Then, of course, I've done work looking at the importance of the body, the genealogy and materiality of the body (e.g. Darder, 2009, 2012, 2018b). Often, Western epistemology has been so cognitively driven, as if the body were not at all implicated in the construction of knowledge, which is absolutely not true at all. Our sensations, feelings, and sensibilities are essential to our human existence. When we think about the transformation of the world, we can only do this through the actions we take with our bodies – through our groundedness: this to mean, our capacity to ground ourselves. All actions in the world are associated with the way we feel in our body and the senses that stir us, not solely logic and cognition. Hence, bringing the body more deliberately together with our construction of knowledge has the potential of expanding in new ways our field of thought and our capacity for political engagement. For me, this constitutes critically understanding the importance of the body to the process of revolution.

J. R.: Thank you so much for this wonderful overview of your work. We have two more questions. One is about your activism and one is about your art. I really was very impressed when I watched your documentary from 2009, *Breaking silence: The pervasiveness of oppression*, I'm not sure whether you would like to talk about that, or whether you would like to talk about other community projects and struggles that you have been involved in?

A. D.: I can talk about a couple of projects here, work that emerged within community. The documentary, *Breaking silence*, was made with students and with people in the community who had lived around this university and were able to help us understand the history of how this university made decisions. They actually helped us to locate historical information, about this Midwest university [University of Illinois at Urbana-Champaign] that was isolated and rural. Community members were important to the project because most of us were not from the area; we were outsiders. So, we wouldn't have known that there were KKK [Ku Klux Klan] attacks on residences 50 or 60 years ago or that there was once a fraternity in the early 1900s that was Klan-oriented

Community members helped us look for material and taught us to better understand the historical conditions. It was a powerful piece of work because it was very much student-driven. Part of the work also involved learning the technology, learning how to go out and speak with other students about the issues. The team members conducted many dialogues about issues of racism and other inequalities on the campus and community; and from all the information collected, the storyboard for the documentary evolved. We did research using the university archives as well. It was a powerful example of how when we do work together as a community, there's so much learning that takes place, beyond just what is produced. The product was the documentary, but what we got from the experience was far greater than anything that we could have imagined. And there certainly was far more learning that took place than would have if it had only been myself and another technology person working on our own. The documentary wouldn't have had the same strength, depth or impact.

Figure 12: Ku Klux Klan student organisation at University of Illinois at Urbana-Champaign founded in 1906. Still taken from Darder (2009).

Another favourite project was doing the independent radio community program *Liberación*. That radio program was aired once a week on Sunday mornings. The students and community members worked together on different social justice issues in which they wanted to engage for the radio programs. A wonderful aspect of this work was that we all had to learn to use the technology together, because the project required the use of recording equipment and Garage Band, in order to create the segments which were pre-recorded and put together into a show that then was played on the air. It was an incredible experience! We learned so much about the issues that were important to the community. We always worked to combine reports on a local issue with a global take on the same issue. For instance, when we were engaging water rights within the local community, we also brought in water rights in other places—such as the water struggle in Bolivia. We wanted to communicate that issues happening locally were very similar to issues happening in other parts of the world.

This approach helped to bring the local-global relationship to the table. On another occasion, we did an environmental program examining a utility plant in the community that had closed a decade earlier and never clean up their contamination. In a community dialogue, we discovered that for families living around that plant, there had been an increase in cancer cases; the contaminated area was having an environmental impact. There was a disproportionate number of cancer cases and the children who played in the contaminated field were being exposed. We connected this experience with other communities where that same kind of environmental hazard was also taking place. We started to identify the politics at work. In many instances, the government, instead of cleaning up the contamination, would simply fence contaminated areas and declare them federal reserves. There was a lot of misinformation and shrouding of the facts by those government officials and

corporations who didn't want to take responsibility for the messes they have made in our world.

With the program, we also did segments that explored the political and pedagogical significance of art, music, and theatre within emancipatory struggles. We explored issues of cultural, gendered, and sexual identity. Here again, students would work together and people would team up on different issues. Someone would say 'hey, I want to do a show on Latina women' and the work would begin on that issue. The project was so much about supporting students and community members in becoming producers of independent media. Through the impact of the radio programs aired in the community, we witnessed the pedagogical and political value of working together. In essence we utilized radio as a form of political resistance through a pedagogy of the airwaves (Darder, 2011). But none of this work could have been done as effectively, if it were not for the participation and solidarity of the students and community working together. It was public pedagogical work fully grounded in the power of the community we had built together through our shared labor.

Figure 13: Antonia Darder, doing a *Liberación* radio program.

I think that pretty much sums up my approach to teaching, scholarship and activism. For instance, with teachers, I want to work with them to create a context, where they are able to talk about what's going on in classrooms and in their schools, a place to actually talk with and support each other. I've also tried to bring people together who are teaching in K-12 [from kindergarten to year 12] with people who are teaching in the university, in order to promote more dialogue across education. For me, separating K-12 and university conversations is an artificial division, because the enterprise of education moves across these terrains, and there need to be ways to connect and engage the work, because the impact of educational policies and practices are felt across the trajectory of education.

Again, you can't make this kind of dialogue happen without bringing teachers, professors and students together. I recall that one of the most poignant moments in my work with teachers occurred when we were challenging standardized testing and decided to have a forum to bring educators together with parents and students. When the young people spoke about the impact of standardized testing on their lives, I don't think there was one person who didn't have tears in their eyes. Because you realize the brutality of it that you can't get from a book. This approach requires a willingness to listen to people, you have to be with people, you have to want to hear their struggles. This has so much to do with our capacity to be not only the kind of educator, but also the kind of scholar and researcher, that creates meaningful research with others, instead of for them. In doing so, we may appear to be the most erudite or academic scholar. Because, actually, people like that tend to spend very little time in communities or spend very little time talking with regular people. I'm not saying such erudite scholars don't contribute, but it's a very different kind of contribution than the kind of contribution that I believe we so desperately need in the world today. What we are in need of is much more grounded scholarship. That is, knowledge construction grounded in everyday life and tied to the actual suffering and struggles of everyday people and their communities.

When the young people spoke about the impact of standardized testing on their lives, I don't think there was one person who didn't have tears in their eyes. Because you realize the brutality of it that you can't get from a book.

For that reason, working with teachers' unions is important. In teachers' unions, we often find the continuum from more conservative to radical educators, who are all, in one way or another, invested in moving a more democratic education project forward. So, you would think that the teachers' union would be the place to do it, right? After all, teachers' unions came out of the struggles of workers. But not necessarily. Because, unfortunately what we often see is that some teachers' unions adhere to a very bourgeois project, a project that has very little to do with transforming the oppressive working conditions of teachers. It's become primarily about getting more money for teachers. I'm not saying that teachers shouldn't get more money. Teaching is hard and usually undervalued work. But I don't think that the money should be the main purpose. We should be focusing on the conditions of teacher labor. That to me is far more important than just getting a few extra dollars a week.

T.A.: Thank you so much for sharing these cases in point. Our last question is: In addition to your scholarly and political work, you're also an artist, you're a poet, songwriter, and a visual artist. Your work as a visual artist displays a variety of themes, including political struggle, family, nature, spirituality and love. Could you tell us more about your art, please? How are you able to do so many amazing things? How do you manage your time, what drives you?

A.D.: [laughs] I don't know. What I can say about the art is that I didn't go to art school, all of the art emerged organically, as a necessity. I say necessity, because making art has been for me a strategy for survival, it has helped me to survive the many difficult moments in my life. My poetry, my artwork, it is the place where I can just pause, I can vent my frustrations; where I can express myself, beyond systematic and logical expectations. Yet, artistic expression is also a way of reasoning and a forum of reasoning. This has to do with our sensibilities and our more symbolic reading of the world. It can be a very visceral expression that is done through color, shapes, textures. We can express our yearning and dreams, through the way we play with words in a poem; when we're really frustrated and angry, we can express and get it out there with a song. In this way, the rage or frustration isn't just sitting inside of us festering. Somehow, it is the creative process that helps us to survive. We need to be creative in order to mobilize the frustration, anger, and struggles that are so much a part of being human. We do art, rather than letting emotions and our shadow energies get locked away in our body, dulling our capacity to be present and to love. Artistic expression can help us not to become stiff and concerned with protecting ourselves all the time. I believe that the only way to do that is to find the creativity within ourselves. So, whether music, art, dance, poetry, all of it has been my way of trying to express my angst, and sometimes my tragic experiences and struggles.

Sadly, our creativity is an essential aspect of our humanity that so often has been squelched or denied, in favor of both efficiency and the privileging of cerebral readings of the world.

Artistic expression is such a soulful and spiritual expression of life. With this in mind, I believe that we can't really understand consciousness if we don't understand it as an expression of our spiritual faculties. It is tied to the inseparability of our human existence. As such, the spiritual dimension of our humanity also generates our capacity for collective consciousness. When we are able to bring all our human faculties to our work—body, mind, heart, and spirit—the potential exists for a true shift in the culture. The beauty of art is its capacity to empower both the artist who produces it and the participants who embrace it. In this sense, art is a powerful political means for our personal and collective transformation. Moreover, to engage artistically in the dialogical relationship between self and life is like teaching, an act of love. The question often, however, is how do we keep loving through our anger and rage and, at times, frustration. We do this by learning to own all of our humanity—the good, the bad, and the ugly. Owning all of it, owning life and death, owning everything that we are. Owning the light and the shadow, owning the yin and the yang [laughs]. Owning all that we are, because this is

Figure 14: *Offering* by Antonia Darder.

precisely what it means to be human. Our humanity is not this perfect thing. Actually, it's not a "thing" at all. We are not "things", we are living, creative organic beings.

I think that art permits us to have a bit more movement in our expression of ourselves, in how we see the world, and how we understand what we're struggling with. That may not be a very clear answer, but that's the way I see it. Making art is a beautiful experience in that we can put it out there for others, but it nourishes us at the same time. Doing a painting, committing color, texture, and lines to a blank space, it's in the very process that we are nourished. I think that so much of life, what is often stripped away from us, are opportunities to have that very organic and sensual experience, where our creative nature has a place to be. And here we can go back to Freire, who understood that our nature, our creativity must have a place to be. We have a right to be, a right to create and express ourselves and be present with each other. And it is through embracing this consciousness, this collective right to be, that we find the possibilities for forging true revolutionary life; and the possibility of creating a different world together. One person alone can't do it, it is something that we must do together.

J.R.: Thank you so much. That was a wonderful insight into your thinking about art. Is there anything that you would like to add?

A.D.: We are at a very difficult moment in the history of humanity. I believe Noam Chomsky has said this [that the world is at the most dangerous moment in human history: Eaton (2020)] and many other people, too. We are truly experiencing a crisis of humanity. Everywhere we look, it

is unbelievable, in that our ability to have conversations that are open, nurturing and nourishing has become more and more difficult—everything seems terribly contentious. Simultaneously, we seem to have lost and sense of ethics and a moral compass. Anything can be made acceptable if it's backed up by even uninformed fallacious public opinion, despite the real consequences it can have on people's lives. There's a relativism that is simply not serving us. Some things in life are not correct; some things are absolutely unacceptable.

Then contentiousness becomes an issue of rights, like 'we have a right to say this'. Oh my! We have some very hard work to do; for in moments of great human contentiousness or disagreement, we are most challenged to find the love and respect necessary to live with authenticity and humanity, in ways that support genuine dialogue. So as long as we continue to create a parasitic culture of destruction that generates paranoia and reinforces fascistic tendencies, it will invade and corrupt our humanity. To derail such corruption, requires that we move past this colonizing culture of destruction, by understanding ourselves as subjects of history, as co-creators of life, and as people of the world who must learn to live together. We cannot create a world in which this planet can survive relying on a culture of capitalist exploitation, extraction and accumulation. The current status quo is not sustainable. It is absolutely not sustainable!

My hope is that there are many people in the world that share these feelings. Unfortunately, many people do feel powerless. This means we have a lot of work to do within our communities, to create the kinds of dialogues and the kinds of opportunities for people to develop their voices and a sense of their social agency. We have so much power collectively. I don't think most people recognize the level of power that we actually have and how we can work together to transform the injustices and inequalities around the world. If we come together to work in a very coherent and integrated way, to struggle against these atrocities, I firmly believe we can transform the world, I don't see any other way possible. I know that I will continue till the day I die [laughs] to resist the oppressive forces that seek to strip us of our humanity. I don't see this as a 'career'. I never have seen my work as a 'career'. My work is my life and my vocation, it has been my vocation to be a part of this larger political project, in which I never feel isolated anymore. Everywhere I go, I find wonderful, strong and beautiful people fighting the good fight. There are people everywhere working to overcome the forces that seek to overwhelm democratic life, and occasionally we see the fruits of their labor: the farmers' strike in India; people fighting in Chile for a new constitution. People rising up gives me hope that our hard work is part of a larger dream for our collective liberation.

> ***I never have seen my work as a 'career'. My work is my life and my vocation.***

We have to roll up our sleeves and be willing to do the hard work together. For it is precisely by doing the work together that makes change possible. It is hard work. But when we bring love, our shared labor, and connection of community together, it makes life meaningful. More importantly, it feels wonderful; it gives us life and so we feel truly present and alive. Whenever I've been involved with other people in mobilizing our political efforts, I've never felt more alive. There's a tremendous power that we as human beings generate collectively. I believe it is exactly this great collective power that those in power, invested in our social containment, never want us to fully understand. This is the power that inspires us, nourishes us, and moves us toward creating a more just and loving world. I believe with all my heart that a vision that encompasses global human rights, social justice, cultural diversity, and economic democracy is truly a vision that is worthy of our labor, of our love, and of our life.

J. R.: You're such an inspiration. On behalf of our team, thank you so much!

A.D.: Thank you for your interest in my work and I hope that it will do some good for others.

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Powerful teaching, the paradox of empowerment and the powers of Foucault. An interview with Professor Stephen Brookfield

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Abstract

This interview follows up on a previous interview with Stephen Brookfield in the *Journal of Applied Learning & Teaching* (Brookfield et al., 2019). It was conducted as part of an ongoing book project with the working title Teaching well that the authors are involved in. This interview may be seen as a teaser for the book that is planned to be published in 2023. It constitutes an extended version of one out of 13 planned chapters and focuses on how power shows up in higher education classrooms.

Classrooms are never power-free zones. Every learning environment contains student-to-student and student-to-teacher power dynamics. We discuss various influences on Stephen Brookfield's conceptual understanding of power, especially Michel Foucault's concepts of sovereign, disciplinary and bio-power and their applicability to education. In this context, we explore similarities between prisons and schools, the metaphor of the panopticon, and the continued relevance of bio-power during the current pandemic. The democratic practice of discussion groups is questioned (despite Stephen Brookfield's personal preference of that modality) and the lecture is reinstated as one of several useful modalities. We then arrive at Brookfield's concept of powerful teaching & learning and how teachers can exercise their power in ethical, productive and responsible ways. The interview ends with Brookfield's advice on institutional criticism.

Since beginning his teaching career in 1970, Stephen Brookfield has worked in England, Canada, Australia, and the U.S., teaching in a variety of adult, community, organisational and higher education settings (the latter include Harvard University and Columbia University). In his endeavour to help adults learn to think critically about the dominant ideologies they have internalised, Professor Brookfield has written, co-written or edited 20 books on adult learning and teaching, critical thinking, discussion methods, critical theory and teaching race.

Jürgen Rudolph (J. R.): Classrooms are never power-free zones. Every learning environment contains student-to-student and student-to-teacher power dynamics. Although your concept of power is influenced by Michel Foucault, the unmasking of power has an honorable tradition in adult education that goes back to at least Eduard Lindeman (whose articles on adult education and social change you edited in *Learning democracy* (Brookfield, 1987)) to whom adult education was the "operating alternative for dominance, dictatorship and violence" and "the answer to blind prejudice and demagoguery" (Lindeman, 1987a, p. 77 and Lindeman, 1987b, p. 115, cited in Brookfield, 2005, p. 48).

Whereas for Lindeman and many others, power is something associated with the rich and mighty, "Foucault argued that in contemporary society power works in much more subtle ways than previously acknowledged" (Brookfield, 2005, p. 45). Foucault (1995) identified a shift from sovereign to disciplinary power with the rise of capitalism in the late 18th century. To quote you, disciplinary power is the "self-discipline exercised by subjects themselves who conduct their own self-censorship and self-surveillance at their own sites of life and practice" (Brookfield, 2005, p. 37). And: "Foucault would say that the external gaze that ensures that people are punctual, driven, and assiduously following the rules has been successfully 'interiorized': that is, it is now experienced as a constituent element of the personality" (Brookfield, 2005, p. 161). You point to both Gramsci and Foucault in persuasively showing that by practising self-discipline, self-surveillance and self-censorship, we collude in our own servitude (thereby rendering sovereign power less important: Brookfield, 2005). You also wrote: "Reading Foucault helps us understand how apparently liberatory practices can actually work subtly to perpetuate existing power relations" (Brookfield, 2005, p. 148). Could you please share your thinking about power, in light of your reception of Lindeman and Foucault?

Stephen Brookfield (S. B.): This might be a bit of a long answer. As I was thinking about this, I was really coming to a judgment that of all the kind of reflections I've done over the years on my practice, the reflection on power probably has been the most important because it's challenged some really paradigmatic assumptions that I used to have about adult education and that I was brought up in intellectually and culturally, at a time when I was doing my diploma in adult education and then my PhD in adult education. Challenging some of those assumptions that I learned during five years of graduate study in the field was very significant for me. But the last point that you mentioned in that question, where you quote me on how surprising it is to do something that you feel is in the tradition of broadly speaking, democratic and liberating education, and then discover that constitutes patriarchal education; you do something in class that you feel is inherently democratizing, and then you find out that in fact, some of the learners just experience it as a slightly revamped form of oppression or manipulation or coercion.

Finding out the things that I thought had no negative aspects to them, actually were experienced as quite constraining has really been important. So an example I've used a lot to illustrate this point is the circle. Ever since I began teaching

Figure 1: Stephen Brookfield. Source: (Brookfield, n.d.)

in September 1970, I would always get to the room early and move the chairs into a circle. This was in the grand tradition of adult education, and the Highlander Folk School and so on. I assumed that the circle was a form of seating, a physical learning environment, that would encourage collaboration and let people feel that I acknowledged they had experience and I respected what they brought to the event. I felt that somehow my being in a circle of learning removed my power from the room. I used to think all those things and that students would love the circle and would find it a very congenial learning environment.

Then I read in the '90s a book by Jennifer Gore called The struggle for pedagogies (1993) and she takes Foucault's work and breaks it down into a higher education context. I started, because of that book and some of my own experience, reexamining the circle and coming to realize that for many students who felt that there was something about them that marked them out as being different – the way they spoke, the way they looked, the way they dressed, the way they presented themselves – that for those students, the circle is actually a heightened form of surveillance. Because now everything they do is in full view of their peers as well as the instructor. Any mistakes that they make are again in full view of everyone. They have no time to decide whether or not the teacher is to be trusted, because the circle has the implicit understanding that everybody has to talk pretty quickly. So I read this whole other analysis of the circle, that was very helpful to me and it complicated my life. But most helpful things in your development as a teacher do often complicate your life, at least in the short term.

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So that part of Foucault's work that challenges some of the progressive, humanistic, traditional practices in teaching, that's been the stuff I've most enjoyed. In *The power of critical theory* (Brookfield, 2005), I look at things like the use of learning contracts as a teaching tool, and the recognition of prior life experiences and the way those are converted into credit within higher education – things that I was a strong advocate for. And then I read this other analysis that helped me realize that as Foucault says, there really is no practice, at least in a hierarchical environment, that can be considered power-free and that everything has a dimension of power attached to it. So understanding that has been enormously influential for me over the last 30 years of working. So that's just the preamble to my answer [laughs]. This is going to be a long answer. So you can go and take a nap and just leave the record [both laugh].

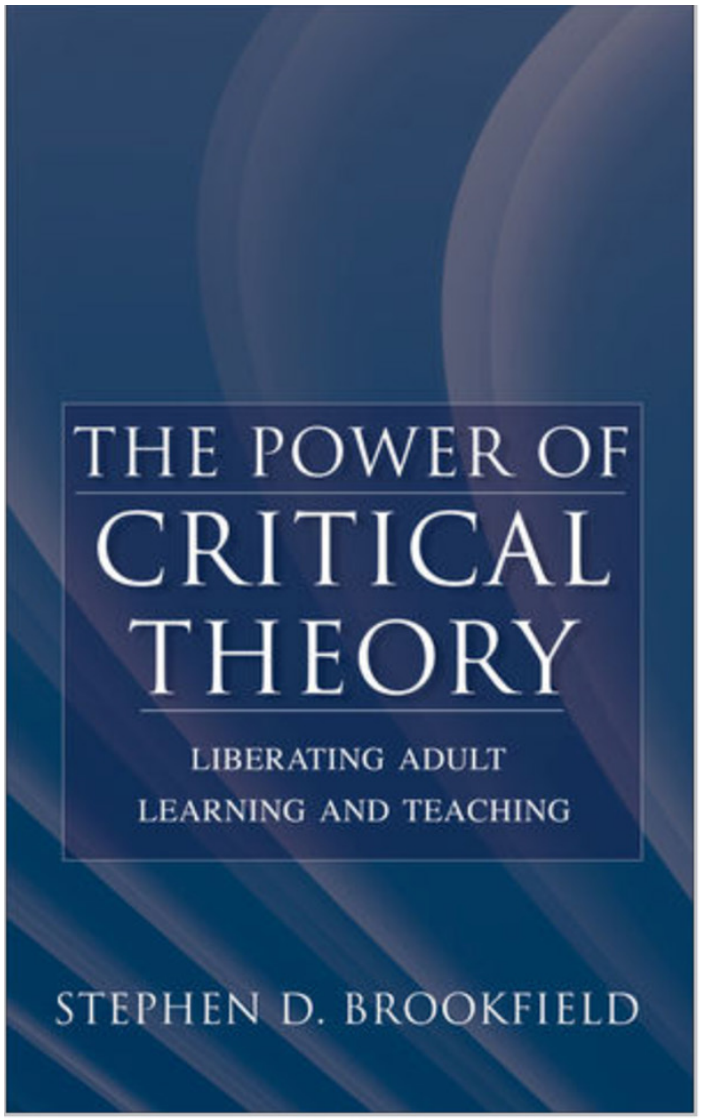

Figure 2: Book cover of *The power of critical theory.*

One of my guiding frameworks that I grew up with as an adult educator and then as someone moving into higher education, but trying to work in an adult educational way, was that the teacher as quickly as possible should get out of the way of learning, should move to the side, should be a resource. They should not be a director *of* learning, but a resource *for* learning. They should try and share their power as much as possible or remove that power from the equation completely. And I use the example from *Becoming a Critically Reflective Teacher* (Brookfield, 2017) of the fly on the wall. That's how I saw my role really, as maybe asking a good question at the beginning of a class or hearing a question and saying: 'Okay, what do we think about that?' and then not saying anything for another 20 minutes. I wanted to be invisible. It was a way of working that came from community development and community adult education. Before entering higher education as a professor, I was running a Department of Community and Environmental Development in an adult education center. So I was very much of this idea that that's what a good educator does: you move to the side, you get out of the way. When you're called on and requested, you come in and help. But otherwise, you just let people run with whatever enthusiasms and passions that they have. And it was strongly influenced by Carl Rogers' (1983) humanistic psychology model of non-directive, supportive facilitation.

But reading Foucault has really been one of the major things that completely changed how I thought about power once I got into higher education. So now, instead of thinking that the teacher's job is to move to the side – and be invisible, something expressionless, silent – I understand that if you stay in the room, and even sometimes when you're not in the room, your presence is still a major factor in students' minds and has a major influence on how they go about their learning. And so even if you stay silent, students will read into that silence some kind of meaning. Perhaps they'll assume that your silence is implicit approval or that your silence signifies a degree of unhappiness because you're not contributing and encouraging and telling them how well they're doing and so on.

I've noticed particularly in multiracial groups the tendency of many white members to stay silent, out of a good intention not to dominate conversation, and to let people of color have the floor. But even that self-silencing that whites do in multiracial conversations is very problematic. Sometimes it's experienced in a completely different way from the way it's meant. So that if you stay silent as a white person when race becomes an issue in class, the students of color may feel that you have no interest, that your silence is an indication that you really don't want to get involved in this kind of conversation. They assume you're disconnected from it, that you don't think it's worth putting in any effort to share what you're thinking. So instead of silence being a helpful behavior in that situation, it is often perceived as an extension of white supremacy. If you are a white person and you don't speak on racial issues, you could be perceived to inhabit a learned framework of thinking: 'I'm white, therefore I have no race, therefore I have nothing to say and contribute to the conversation'. So that was the first big challenge that thinking about power has had for me, that understanding of the teacher as being someone who should get out of the way, get to the side, and let students self-directedly run the show.

The second theme that's really been challenged for me is empowerment. In the community development tradition that was strong in England where I did my graduate work in Adult Education in the 1970s, empowerment was a strong

idea. I internalized this idea that I can share my power, that I can encourage people to be more confident about participating, and have greater confidence in whatever they were saying with their voice. But then from Foucault and others I've realized, and it's an important insight for me, that empowerment can't be given, it can only be claimed. So I'll often say that you can't empower people, all you can do is remove some barriers that are maybe getting in the way of them claiming their own empowerment.

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Empowerment is an act of assertion and control that springs from a self-belief that people have, or a confidence in the rightness of their decisions or the rightness of their projects they want to pursue or the actions they are engaged in. And it's all often bound up with a collective impulse where a group of people realize together, we have the same things in common and in collaboration we have more power and more understanding and more support than as a single person or a single learner. So that was quite significant to me that really, you can't empower people. And I hear that verb a lot. 'I want to empower my students', 'I want to empower my learners', 'I want to empower my colleagues'. I think it's a misunderstanding. Because the most you can do is help create the conditions for that to happen by removing barriers. So you can say: 'All right, the curriculum that has been sent out is not cast in stone. So let's see if it needs to be revised to be more relevant or meaningful or helpful to you'. And you can say, 'this is what the college or the university requires for assessment. But let's see if we can introduce some other assessment formats that will help you develop different capabilities than only one form of assessment which is often written and textual'. I think that if you can remove some barriers, then you can create the conditions under which empowerment is more likely to take place. But it's not like you can directly go and empower people.

The third thing has to do with how teachers exercise their power. If you'd asked me when I began my career 'how are you exercising your power?' I would have regarded that as a silly question. Because I would say 'my responsibility is not to exercise power, my responsibility is to help students learn'. I had this, in Foucault's terms, notion of power as sovereign emanating from me, the teacher. I didn't like that top-down hierarchical model. I had all the critiques of banking education when I began in the '70s, influenced by Freire (1970). So I would say 'no, I'm not here to be powerful or to exercise power. I'm here to help learning'. But then, reading Foucault and also to be fair, reading Freire: at one point in his dialogue with Ira Shor, Freire says that all education is directive, it's just a case of how that direction is happening, and what the direction is, where you're intending to go (Freire & Shor, 1987). He starts to acknowledge teacher power. To me, that was helpful. And he got me, along with others, to think about something you've asked: What is an ethical, productive and responsible exercise of power? I've thought a lot about that over the years. And I'd say there are three indicators that that is happening, that you're using your power as a teacher or an educator in a supportive, ethical and responsible way.

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The first is that whatever you're doing is in service of learning. Power by a teacher is exercised responsibly, ethically and productively when it's somehow in service of student learning. And that means that sometimes you have to say to someone 'what you wish to do is not in your own best interests'. When I met with my dissertation advisor for the first time and he told me 'having this methodology to determine your findings, to use in your PhD research, doesn't make sense, you've got to change your methodology completely': that was an example of an exercise of responsible and ethical power, because he had judged based on his experience that I was caught in one particular way of looking at things, and that I needed to be introduced to an entirely different perspective and set of practices. I think when power is clearly exercised in support of learning, that will be the first condition that I would look for. But it's complicated.

The second condition of an ethical, productive, and responsible use of power is that the rationale behind it is constantly disclosed. So for every action that you take, you explain the reasons for it and why you feel it's in the best interest of your students' learning and how you're going to lead people in an activity. You'll often refer back to earlier examples of similar activities as one reason why you're doing it the way that you are and so on. So as you're making decisions and enacting them, you have constantly to talk those out and to disclose the rationale to make public the thinking behind your practice.

Then the third condition of that responsible, ethical exercise is that you provide constant opportunities for people to critique your power. There are different ways of getting anonymous commentary on practice from students like backchannels, Sli.do, and the Critical Incident Questionnaire (Brookfield, n.d.). So if you're doing that, your exercise of power will appear in those critiques, and if there is something that people are perceiving as arbitrary or haphazard or unfair or unclear, that will come out and then you can deal with it head on, and model a self-critique of about how you're exercising power.

Two final things I wanted to say: you had mentioned in your question student-to-student power dynamics. A lot of my thinking, and I guess that of others as well, has focused on the teacher use of power. Because we are teachers, we're naturally interested in how we think and what we do, but there is also, as you rightly acknowledge, this whole area of student-to-student power dynamics that needs to be kept in mind. I would say that if you're teaching well with an awareness of power, you are as concerned with student-to-student power dynamics as you are with teacher-to-student and student-to-teacher power dynamics.

Some of the things that I try and keep in mind around this issue are that any differences that exist outside the classroom in terms of status, prestige, habit, who gets listened to,

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who usually gets to talk first – all those differences will be immediately imported into the classroom setting. So they will be there, and they will play themselves out unless you do something to intervene. So for me, that's been very influential on my own practice. I've written two books about discussion protocols (Brookfield & Preskill, 2005; 2016): how to equalize participation, how to intervene to create conversational formats that hear from everybody, that allow a range of perspectives to be articulated early on, that don't allow people to dominate in a way that's perceived as being unfair or controlling. So all of those exercises are interventionist actions created by the teacher. I do them with certain ends in mind.

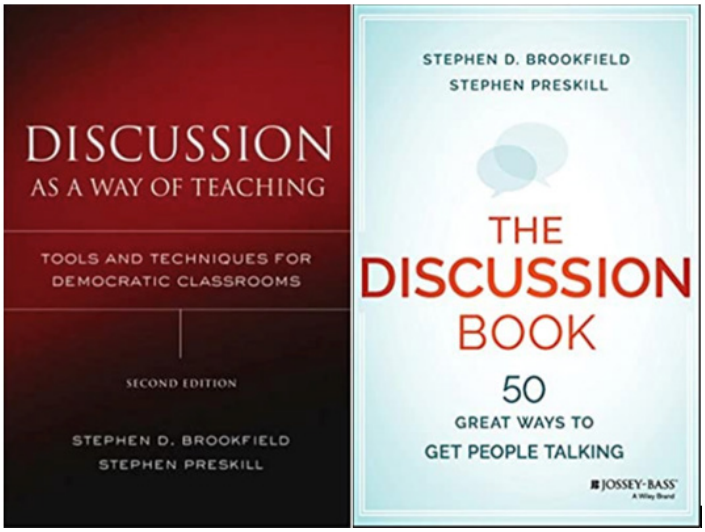

Figure 3: Book covers of *Discussion as a way of teaching* (Brookfield & Preskill, 2005) and *The discussion book* (Brookfield & Preskill, 2016).

In this context of student-to-student power dynamics, one basic principle of a lot of my classroom practices is to equalize participation as much as that is possible. And I realize you can't see this as completely neat and bounded. But I do design exercises to stop unjustified dominance by a minority of voices. And I constantly advocate using multiple instruction and modalities and assessment modalities for the same reason.

The final thing I would just say on this is that as a teacher I understand that power exists outside of my classroom. My classroom is not a self-contained universe unaffected by the kind of cultural or social or economic streams flowing in the outside world. The culture of my institution is going to be very important in terms of what freedom I feel to experiment as a teacher with innovative practices. I've taught in publicly-funded institutions in the United Kingdom and Canada, and then privately-funded institutions in the United States. While both of them operate under this kind of neo-capitalist, let's-attract-consumers model, there is a difference in emphasis. In the United States, ever since I took my first job in 1982 here, I was made aware, working for private universities that you have to generate enough tuition revenue and income to justify your job. That reality places a great deal of pressure on me to bring as many people in as possible to a program that I'm working with, and sometimes I've made judgments about students' suitability for admission that really shouldn't have been made. I think I've been in a position where I've admitted students in a program to get the numbers up, because we need a certain number of students to keep the program alive. Everything that you do as an educator happens in a wider context.

That's why I feel that political adeptness or astuteness is an important part of a teacher's repertoire of skills. It doesn't matter how brilliant you are pedagogically, if you're unable to make a power map of the institution that you're in, if you're unable to develop alliances that work with people who will have your back when you're facing some pushback from students or from the administration, if you don't know how to adapt the mission language to describe what you're doing so that it's more acceptable and congenial to the powers that be – if you can't do those things you're always going to be at a disadvantage. Those are all micro-political skills that require an understanding of the power dynamics of the institution that you work in.

J. R.: Thank you so much for this fabulous answer! I also think that you can never ignore politics when it comes to education because it's intrinsically intertwined. It's naive to think that anything that happens in education is apolitical. I got a bit stuck into Foucault, so I hope you don't mind if I ask you some more questions in that vein. Foucault developed his concept of disciplinary power in the context of his historical analysis of the birth of the prison. It exhibits an attentive malevolence and is "a type of power which is constantly exercised by means of surveillance" (Foucault, 1980, p. 104, cited in Brookfield, 2005, p. 132). Foucault uses the term 'discipline' to designate a particular kind of power that operates directly on individual bodies. He conceptualises disciplinary power as to be present whenever there is a norm. Consequently, disciplinary power cannot only be seen in prisons, but also in other institutions – factories, families, hospitals, the military, psychiatric institutions, social service agencies and the state in general, and also in schools and adult education.

Foucault argues that from the 18th century onwards, individual bodies are perceived as machines and take centre stage. In order to increase economic productivity and reduce resistance, the goal is to discipline the body, optimize its capabilities, and maximize its productivity and docility (Foucault, 1995, 1990). Individuals are coerced into accepting standards for behavior that they believe constitute the norm and they come to act as if they are always under surveillance. They are subjected to a continual process of surveillance, examination, judgment, and correction, and transformed into docile bodies that are measured and ranked by their relationship to the norm (Foucault, 1995). Disciplinary power operates primarily by facilitating an individual's acceptance of the norm rather than through violent and confrontational force (sovereign power).

Disciplinary power is relational rather than personal: it circulates through hierarchical networks, where individuals are 'relays' for power that both passes through them and is applied to them (Foucault, 2003). "Disciplinary power is not divided between those who have it and those who do not, or between those who hold it and those who are subject to it. Instead, individuals who exercise disciplinary power are interchangeable" (Havis, 2014, p. 113). Disciplinary power can turn a man into a soldier and an undisciplined child into a well-behaved pupil. "[D]isciplinary coercion establishes in the body the constricting link between an increased aptitude and an increased domination" (Foucault, 1995, p. 138). "As individuals are rewarded and promoted for their success at complying with the norm, they become increasingly invested in maintaining the norm and the disciplinary process by which they are judged and ranked" (Havis, 2014, p. 115).

You chillingly wrote that disciplinary power "turns lifelong learning into a lifelong nightmare of 'hierarchical surveillance, continuous registration, perpetual assessment and classification'" (Brookfield, 2005, p. 132; Foucault, 1995, cited in Brookfield, 2005, p. 132). In what ways do you think are schools and other educational institutions like prisons?

Figure 4: Lecture on the evils of alcoholism in the auditorium of Fresnes prison. Source: Foucault, 1995, Figure 8 (between pp. 169-170).

S. B.: The notion that they teach in a prison-like environment is one that most readers would hate to hold. No one wants to function like a prison guard, or occupy a leadership position where they act like a prison warder. Over the years, the metaphor of prison is one of the most common metaphors that I hear from teachers I know who work in public schools. Teachers in high schools or elementary schools are constantly complaining about feeling controlled by a system, of being forced because of a testing deadline to write their curriculum in a particular way, and to focus only on developing skills that will make the school look good in light of pupils' attainment on educational achievement matrices. I think that many of us feel that we're working in a system that is tightly constrained and where our actions that we can take, the range of acceptable actions, how you can talk to people, those are controlled by the system. The ways in which people can display progress, growth, achievement, what counts as a good student, those are all determined by a norm of what bell hooks (1994) called the norm of "bourgeois decorum". So there is a lot of direct transferability. Of course, you would hope that schools would operate in a more benign way than some prisons with violent prison guards where they actually physically beat inmates. You would hope that there won't be a lot of direct attacks, student-to-student attacks or student-to-teacher attacks, but in the United States, we have this whole history of school shootings. It's usually an outsider who comes in, but sometimes it's the students themselves. And, the system is often criticized for not picking up the signs of student alienation and so on. I think the notion of sovereign power still has some play, although I understand the arguments for disciplinary power and I think that's a very helpful construct.

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I do know that the principal of a school or the president of an institution or a college or university or the dean of a particular school or department does have an awful lot of power in terms of setting a tone within an organization just as a warden has the power in terms of setting tone regarding how prisoners are going to be treated. The prison is set up on a schedule, on a system, that does not have the logic of inmates' well-being as its prime organizing idea. No, it has the idea of organizational effectiveness, of institutional, smooth running, a bureaucratic notion, and schools are just the same. In colleges and universities, you have departments, you have siloed elements of intellectual control, there is a mistrust of interdisciplinary teaching, there's a mistrust of team teaching, it seems too complicated and too costly. There's a lot of parallels between the systems.

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I disagree fundamentally with Althusser (2001), who sees teachers as dupes within schools that are run as tightly constrained, almost-penal systems. I don't know any teachers who are not aware of being constrained by systemic requirements. And then, just as with prisons, I think in colleges and universities and most organizations,

there are also these unofficial networks and channels of communication that develop where people find each other and brainstorm how to undermine or sabotage the system. They talk about how they can keep their creativity protected and challenge notions of what it means to be an efficient teacher using best practices. That whole best practices, efficiency or effectiveness model, I would say, is ultimately often built to serve the institution's needs rather than the students' needs, although it's always couched in helping students learn.

There are incredible numbers of similarities between how schools, colleges and universities function and the way that prisons function. I know from my own experiences as a school pupil, when summer came around, it felt like I was like being let out of prison. I was released from spending my days in what I felt were completely meaningless tasks that had nothing to do with the realities of life. So I don't think it's at all far-fetched to say even though most people would shudder at the idea that we work in a prison, I don't think it's far-fetched to say that there are many systemic similarities between how prisons function, and the way that higher education and schooling functions.

It's not far-fetched to say that there are many systemic similarities between how prisons function, and the way that higher education and schooling functions.

J. R.: My next question is regarding the panopticon. You've alluded to that when you were talking about the circle, but perhaps, we can still talk about it a bit more. As you know, originally Bentham's concept of the panopticon was an 'ideal prison' that featured a central tower with cells surrounding the tower in a backlit circle, an arrangement that allowed a central supervisor located in the tower to observe each and every one of the prisoners in their cells (Foucault, 1995; see Havis, 2014).

Foucault developed the concept of the panopticon further into a generalizable model of functioning that illustrates the effect of disciplinary technology in everyday life. In its various forms, the panoptic schema serves "to treat patients, to instruct schoolchildren, to confine the insane, [and] to supervise workers" (Foucault, 1995; see Havis, 2014). Due to the panopticon, prisoners/patients/schoolchildren/workers become complicit in their own domination: they behave as if they are constantly under surveillance and consequently conform their behavior to the norm. The result is the "automatic functioning of power" through "permanent surveillance" and without the immediate use of force (Foucault, 1995, p. 201; see Havis, 2014). The individuals ultimately discipline themselves, and their domination is not dependent on any other person. Foucault's discussion of the panopticon thus allows us to see more clearly how disciplinary power operates. In the 21st century, the chilling metaphor of the panopticon acquires additional meaning when considering the surveillance by governments of their citizens (e.g. the revelations by Edward Snowden or the way China uses AI and mobile apps) and also the 'surveillance capitalism' by Big Tech (especially Facebook and Alphabet) of its customers (Zuboff, 2019). What are your views regarding panoptic schemas in society and education? Do they also sound Orwellian to you or like we are in the Matrix (the 1999 movie)?

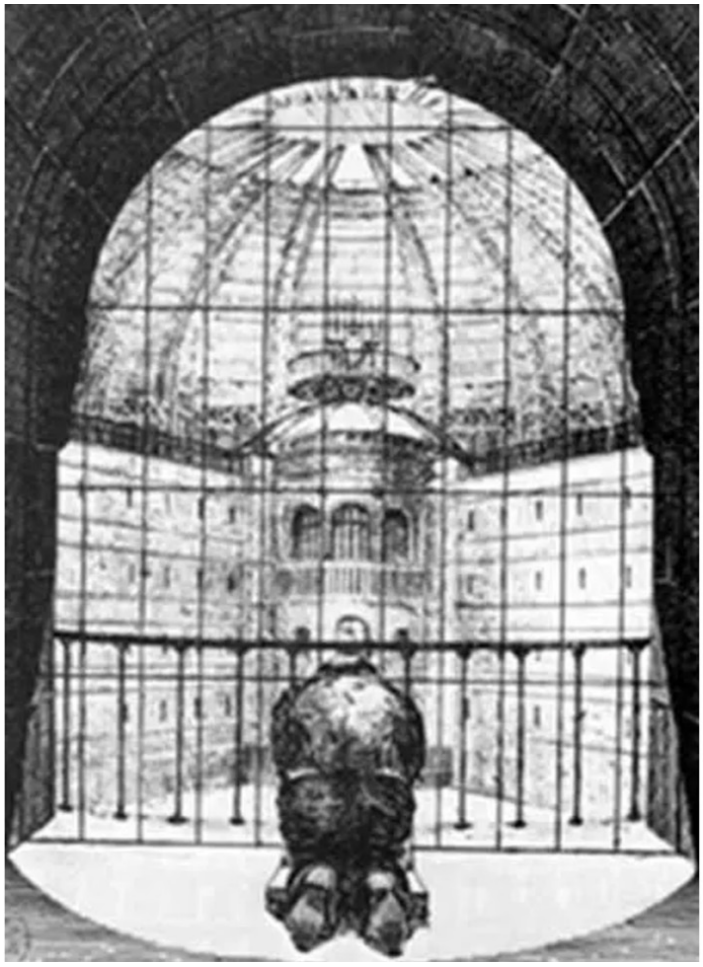

Figure 5: A prisoner kneeling at prayer before the central inspection tower. Source: Harou-Romain (1840), p. 250, cited in Foucault (1995), Figure 4 (between pp. 169-170).

S. B.: My first response is thinking that despite their authoritarian elements and the way that social media surveils us so perfectly, that is just the reality today. It's not that I think of it as Orwellian or like the Matrix. Those examples are of a dystopian future that's waiting around the corner unless we wake up to what's going on. It's just the way the world is, it's the empirical reality in which we live right now. And it has been for quite a while. But I would say that in terms of the growth of the internet, that process of surveillance has just been intensified incredibly in recent years, both in the wider society, in the United States anyway, and also within schools.

As I was growing up as a teacher, there was a surveillance element embedded in a lot of the practices that were portrayed as being open, experimental and collaborative, like there were colleges where I taught younger adults, where there was an open classroom door policy. I also have been in degree-awarding institutions which have this policy, so you have to keep the classroom door open. The rationale for it always was that someone moving around the building might overhear something from a classroom and think 'wow, that's really interesting' and just hover outside and be

educated by the wisdom or insight that was being shared at the other side of the wall in the classroom.

Also, the classroom open door policy was designed to help teachers learn from each other. So as a colleague, you'd be walking by a colleague's classroom, you see them doing something or hear them doing something, and you just spend a few seconds observing them from the corridor, and you pick up an idea and think 'Oh, that's a great metaphor', or 'it's a wonderful way of explaining it' or 'what a terrific activity', and then you adopt it in your own practice. So the open classroom door policy was portrayed as a way of encouraging collaboration and the improvement of practice amongst teachers.

But I experienced it always as direct surveillance. And I hated the open door policy, and I would close my door in contravention of it because one of the ways I felt it was important for me to have the freedom to do some experimenting was to have some privacy over what I was doing as a teacher. I didn't want people to know all the time the kinds of things I was saying or the activities that we were doing in class.

The idea of open classrooms was very big in the 1960s and '70s when I was a teenager and then moving into adulthood: the idea that classes could be held almost like in some big public space. You often see this in the summer when in Minnesota, students are so fed up with being indoors, they persuade their teachers to go outside and go on the lawn in a college. You'll have different classes being taught in a kind of open environment so that people can overhear each other. I always resisted as a teacher going outdoors, although I wanted to be outdoors. I had the feeling that once my practice became public then I would feel more constrained, I felt like I would have to watch what I say, the expressions I use, the examples I adopt, the kinds of activities that we're doing in class, and so on.

So I do think that a lot of that surveillance technology has been present all my life, but in cyberspace, it is just intensified incredibly, and of course, the capacity of algorithms to identify what our preferences, choices and orientations are and the ads that feed straight to us. It's clear that we now all have digital identities and digital footprints, and there is a particular profile of our identity that's been constructed in cyberspace, and that is very influential. We may not be aware of it, but negotiating our life is being subtly programmed by these algorithms in terms of what new websites we're turned on to or made aware of. I'll often get books appearing in a little side panel on the screen that I have, or I'm a guitar player, I get ads for guitars. These are here based on my consumer profile, and they know the kinds of books I'm interested in and the kinds of guitars I'm interested in. Amazon is a perfect example of that.

This has been really clear in the pandemic as we have moved so much temporarily to a completely online form of learning. Zoom has been the predominant platform that has got a great deal of traction because of the pandemic. That feeling of being surveilled is constant in Zoom, because you're being surveilled by the camera and one of the ways that I tried to get by that early on, was having a policy that you don't need to have your camera on when I'm giving any kind of presentation, feel free just to turn the camera off. But if you don't do things like that, then students now have to comply with what an attentive student looks like. So they have to keep looking at the screen. They can't lean back and close their eyes or lie on the floor as a way of processing information, all of which to me would be very helpful. I always close my eyes when I'm considering new ideas. And I'll often close my eyes when I'm responding to student questions, because the activity of thinking happens much better if I shut out visual stimuli. But now I can't do that and students can't do that, because it's not good Zoom etiquette. And then asynchronously, there is this constant and justifiable pressure to respond to previous postings, and that's how you show you're supporting your peers' learning and how you show you're also developing your own understanding by questions you raise of peers and feedback you give on their posts. But there are deadlines for those because it's unfair to keep somebody hanging around forever for reactions to their post. But, those deadlines are themselves a form of surveillance. And you can tell who has read, who has logged on for how long and so forth.

Even though we're spending a lot of time alone because of the Covid-19 virus, in some weird way, we are more publicly on view than we ever have been before because of our reliance on technology and the web. I'm constantly reminded of Marcuse's (1991) analysis of privacy, of the need for periods of privacy when you extract yourself out of surveillance mechanisms, and you find some corner of your life where you are truly alone. And he says that that moment of individual privacy or those possibilities for individual privacy are necessary for us to re-conceptualize how we want to re-enter the world. So he doesn't see privacy as a retreat from the world. He sees it also as the necessary precursor for some critical reflection that allows you then to reengage with the world. I think privacy is less and less available to us. So I turn off my camera, I have it covered when I'm not doing something like this, talking directly to someone. But there is still the sense I have now that I am more under public scrutiny than any other time in my life and I'm 73, so that's covered quite a span of time.

J. R.: These are very valuable observations that you've been making and thanks a lot for them! Just a quick comment on the camera during Zoom meetings. My students in Singapore, almost 100% usually don't turn on their cameras. I've thought about this quite a bit because it makes me unhappy, as a teacher, if I don't see my students because I feel disconnected. But at the same time, I appreciate all the reasons that you were giving earlier. Some of the students are not in conducive circumstances, they may also not want to show everybody how they live, how cramped their living conditions may be, how little privacy there may be, and so on. But during presentations, I still think it's quite a good practice -- although not everybody follows it – to turn on the cameras. Especially in the beginning of the pandemic, I felt like I was speaking into the void, it was a very disembodied, very alienated feel. Of course, after two years, I'm completely used to it, it's the 'new normal'. But I think a lot of people, me included, certainly look forward to going back to physical classrooms where we can see the students again.

In addition to disciplinary power, Foucault developed also a complementary concept of a technology of power: biopower. Whilst disciplinary power focuses on producing individualizing effects by manipulating individual bodies, biopower centers on large populations (rather than individual bodies). According to Foucault, biopower is generated through its *dispositifs* (apparatuses): sexuality, race, productivity, health, mortality, fertility etc. "[B]iopower is what fashions, monitors, surveys, controls, and secures populations in terms of a calculus of forces: health, hygiene, and vitality, but also infirmity, sickness, old age, vice, and degeneracy" (Mendieta, 2014b, pp. 46-47). 'Biopolitics' is Foucault's term for the intervention of political power into the processes of life. It produces and circulates through biopower and maximizes a population's "subjugation and exploitation with the least cost of expenditure of power" (Mendieta, 2014a, p. 39; see Foucault, 1990). Biopower cannot be reduced to the study of one particular institution. In addition to the usual suspects (schools, barracks, prisons, and hospitals), there are also the "agencies that monitor whom we marry, whether we are healthy, whether we have been vaccinated, everything that falls under the general umbrella of 'public health'" (Mendieta, 2014b, p. 47). With the body being a "biopolitical reality" and medicine "a biopolitical strategy" (Foucault, 2000, p. 137), Foucault also seems to be highly relevant in our present pandemic. What are your views of biopolitics and biopower during the current pandemic and how governments and educational institutions have responded?

S. B.: Over the last few decades, I guess since he died [in 1984], I've often thought to myself, 'man, I wish Foucault could see what's going on right now'. He died before the whole social media explosion, before the web was a mass phenomenon. And then I think of how COVID policies have been framed and disseminated. In a federal system like in the United States, each particular state – or as with Canada, each particular province – has a lot of authority over what goes on within its boundaries. Analyzing how mandates are decided upon, how directions as to what those mandates entail are disseminated over public media, the way in which urban myths grow up, and then are taken by another section of the media and rendered as legitimate medical science, like taking these crazy drugs to offset the effects of COVID and so on.

Then you think about how many of us, in colleges and universities, have had to deal with this. It's been very interesting for me to see how the mandate of needing to generate tuition revenue, that fundamental rationale that lies behind the neo-capitalistic mode of institutional functioning. We have to attract consumers and that so strongly undermines what we're doing in terms of educational policy. Because if you're a college that charges a lot of money in the United States, but you're not meeting for classes and students are all at home with their parents and are not interacting with each other, then the whole rationale for charging vast amounts of money for the 'college experience' is called into question. Therefore, colleges say, 'well, we've got to get students back as quickly as possible' so that parents will feel they're paying for something. They're paying for this idea that students are gathered together in a quest for truth and beauty and that character will grow because they're on a college campus and so on and so forth.

The pressure to ignore medical science and to bring students back on campus is so strong that over and over again, at least in this country, we've seen colleges allowing people back on too soon, having a sudden outbreak and then having to reinforce a mandate of all instruction being occurring through Zoom or other online mechanisms. When I read Foucault, I read him as a critical theorist, and when I read his work on norms and on bio-power, the dissemination of supervision and so on, I keep coming back to the notion of dominant ideology and the way the dominant ideologies are learned and internalized and then how they frame daily practices within institutions. So when he's talking about bio-power, when he's talking about the mechanisms by which medical policies are instituted, I understand this within a critical theory frame of capitalism.

The pressure to ignore medical science and to bring students back on campus is so strong that over and over again, at least in this country, we've seen colleges allowing people back on too soon...

A modified form of capitalism is the underlying paradigm for the organization of higher education. 'We have to make a profit, we plow those profits back into further expansion'. 'We are a successful university in terms of building more and more buildings or how we widen the curricula that we offer – let's create a school of law, how about a school of public health, a school of entrepreneurship, etc. This is how we move up the league tables and establish a reputation'. I've been employed in various institutions that have said 'we want to elevate our public profile' and the way that you do that is usually by having a giant fundraising effort, building new buildings, hiring talent like for an English Premier League soccer team. So I always say 'you have to look for what dominant ideologies are in place, and how those different ones are supporting each other or kind of contesting each other', which sometimes also happens. But I think Foucault would have had a field day with COVID. It speaks so directly to his concerns, and also the concerns of anti-vaxxers are framed in terms of anti-surveillance. 'We do not want to be surveilled. We don't want all these records on us, it's our own choice'. So not taking a vaccine is seen as an active individual, powerful liberation. So yeah, I think his analysis works perfectly around COVID.

Foucault would have had a field day with COVID.

J. R.: So do I. I also would love to have seen Foucault live a much longer life so that he could have continued observing what is happening in the present. I have this very long quote from Foucault where he compares the lecture to the seminar. And perhaps surprisingly, he believes that the lecture is actually less fraught with power relations as opposed to the seminar. To quote Foucault:

"In France, the lecture system has been strongly criticized: the professor comes in, stays behind his desk for an hour,

says what he has to say, there's no possibility for student discussion. The reformists preferred the seminar system because their freedom is respected: the professor no longer imposes his ideas and the student has the right to speak… [B]ut don't you think that a professor who takes charge of students at the beginning of the year, makes them work in small groups, invites them to enter his own work shares with them his own problem and methods – don't you think that students coming out of this seminar will be even more twisted than if they had simply attended a series of lectures? Will they not tend to consider as acquired, natural, evident and absolutely true what is after all only the system, the code and the grid of the professor? Isn't there the risk that the professor feeds them with ideas much more insidiously? I don't wish to defend the lecture at all costs but I wonder whether it does not indeed have a kind of crude honesty, provided it states what it is: not the proclamation of a truth, but the tentative result of some work which has its hypotheses, methods and which therefore can appeal for criticism and objections: the student is free to uncover its blunders. Of course, seminars and work groups are necessary, but more so, I believe, for training in methods than the exercise of freedom. When I lecture…, I consider myself more like an artisan doing a certain piece of work and offering it for consumption than a master making his slaves work" (Foucault, cited in Simon, 1971, pp. 199-200).

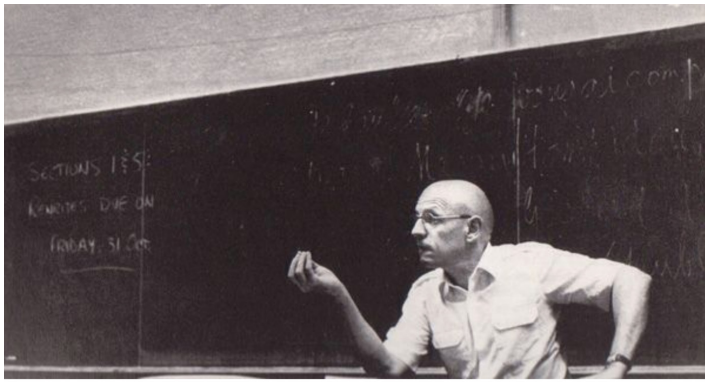

Figure 6: Foucault lecturing at Berkeley in the early 1980s. Photograph by Randy Badier. Source: The deleuze seminars (1986).

We could interpret Foucault's quote as saying that a lecture "might neutralize power relations by rendering them more visible; whereas the ostensible freedom and reciprocity of the seminar may disguise power relations to the extent that students uncritically absorb what is only the informed opinion of the teacher" (Deacon, 2006, pp. 184-185). You have discussed how to exercise teacher power responsibly and ethically earlier. But perhaps you would like to comment on Foucault's quote?

S. B: Yeah, I love that quote. And he's saying 50 or more years ago what Freire said almost two decades later. Freire is often identified as the anti-lecturing representative in a critique of higher education. But in his book with Ira Shor (Freire & Shor, 1987), he talks about how lectures can be critically stimulating events, introducing new territory and productively troubling ideas to students. And he says, 'it's not that a lecture in and of itself is an example of banking education and that discussion is an example of problem-posing liberating education, because discussions themselves can be manipulated'. And as Foucault says, students can be twisted into moving in certain directions, without them even knowing that that's what is going on. So I really like that point. And I've always been opposed to seeing a lecture or a discussion as two opposites of a continuum, one an authoritarian, uninterrupted transmission of knowledge and the other a collaborative, critically and enlivening analysis of ideas. I don't think those two are an accurate bifurcation, because a small group discussion, as Deacon points out in his commentary, can be very manipulative.

In 1970, almost the same year that Foucault's quote came out, there was an article that had a big influence on me written in British adult education by a philosopher called Ralph Patterson. He introduced the notion of "counterfeit discussion" (Patterson, 1979) and I've held on to that for 50 years. Counterfeit discussion is discussion where people are talking in a group so it looks collaborative, open and free. But in fact, the discussion is being manipulated by the leader (or the teacher or instructor) to move towards a certain pre-defined end. So it's not really a discussion in the sense of being free and open-ended at all. It is a manipulated conversation that happens under the veneer of a supposedly democratic classroom activity. And I have been in so many counterfeit discussions over the years where I recognize that that's what's going on; we are being moved to a preordained conclusion and what is proposed to us as being free and open-ended is actually controlled within predefined parameters. There are certain areas in which we can't go because the leader will bring us back to what he or she determines is relevant in the discussion.

I agree completely with that critique. I personally prefer a discussion-based methodology, I'm drawn to that. But as an educator, I try and work in a pragmatic way, in the best sense of that word from the American philosophical tradition: pragmatism as the purposeful experimentation with experience. I'm open to lecturing, I'm open to using discussion, I'm open to silence, I'm open to speech, I'm open to text. I'm open to images and sounds. The judgment you make as a teacher is: what is the context in which you're in? Who are the students in all their different complexities that you're dealing with? What are the educational objectives that you're trying to achieve? Then out of an analysis of those three things – context, students, and objectives or purposes – you make instructional choices. So I'm happy to do anything if I feel it's in the service of student learning. And I do think that teaching well is almost by definition, multimodal, because there are always going to be shadings, nuances and subtleties in any situation in which you find yourself, you're always going to have to be switching things up, bringing in different methodologies. It's inherently responsive. You make the choices on what you're going to do at any particular time based on what you're finding out about the context and the students and how they're experiencing the learning in a particular direction that you're trying to take them.

Teaching well is almost by definition, multimodal.

J. R.: I remember you referring to Ralph Patterson's counterfeit discussions. That's indeed a very powerful concept. What constitutes a powerful act of teaching, or a powerful example of learning?

S. B.: I deal with this in a book called *Powerful techniques for teaching adults*. In chapter one, I start off by saying, 'What is an act of powerful teaching? And what is the kind of powerful learning that is induced by that? I do define powerful teaching as having four characteristics. The first is that an act of powerful teaching is one where you're deliberately taking account of the realities of power that exist, trying to understand power dynamics in the context in which you're working. I would say that, in my own career, all the time that I've spent designing protocols, classroom activities, discussion protocols to equalize student participation, that for me has been an act of powerful teaching, because it's deliberately informed by my understanding of power dynamics.

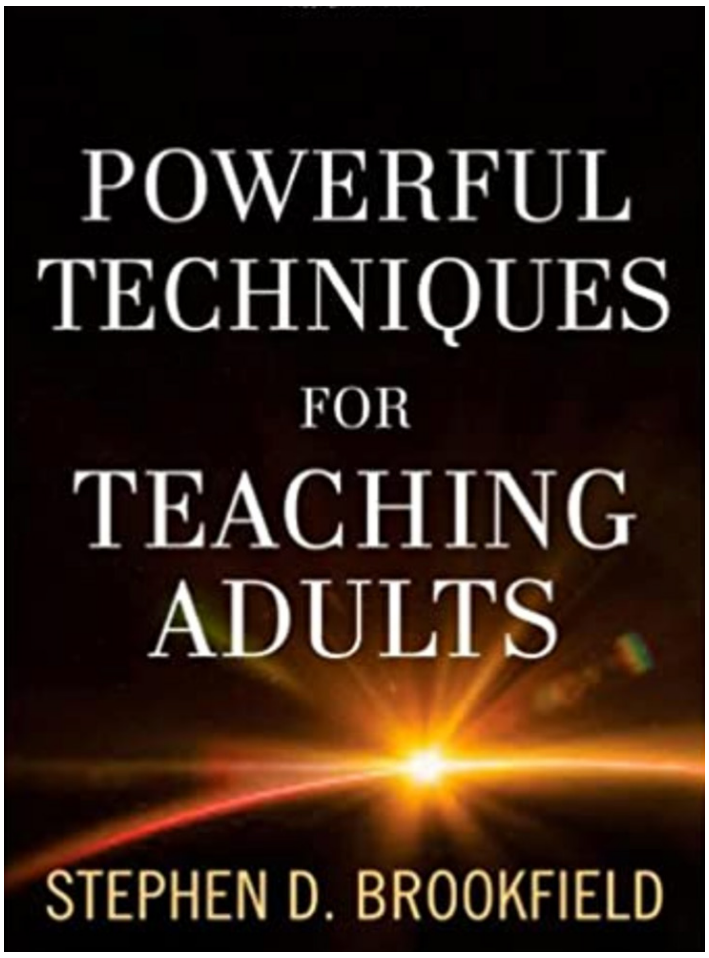

Figure 7: Book cover of Powerful technique for teaching in lifelong learning.

Secondly, I think an act of powerful teaching is one going back to empowerment, it's an act that supports learners in planning their own empowerment. That's partly the removal of institutional systemic barriers to allow them to have enough confidence and energy to really speak in their own voice and to push for what they want. But I think also you help people claim empowerment by building up their skill set, building up their knowledge in a way that they're getting access now to ideas and information that they can use to transform their own lives and communities. So I do think there is some content around exercising your own agency, developing your own voice, developing your self-confidence, knowing how to build collective networks and collaborations. When you try and get students to grow and develop in those ways by helping them internalize those skills and dispositions, I think that is supporting them in a powerful way.

Thirdly, I think that any teaching that helps students become aware of power dynamics in the classroom and in the wider world is what I would call an act of powerful teaching. Every discipline has its own canon, its own epistemological grammar, its own norms, criteria for judging what is legitimate knowledge and how that knowledge is created. I think anytime you get students to understand that that is a constructed reality; that what is regarded as the kind of gold standard ways of doing research in a discipline, comes from somewhere and has been created to represent a certain intellectual history or a certain set of interests. Anytime you're doing that, you're teaching in a powerful way, because you're making students aware of how power operates in a wider context.

And then fourthly, a condition of powerful teaching is what Foucault was saying with the lecture in that [above] quote, it renders the teacher's power transparent. In other words, you are striving for full disclosure as to why you're doing what you're doing. You're making your rationales clear for the choices that you're enacting. You're very open and transparent about the reasons for your actions and choices. Part of that transparency is being open to critique via anonymous feedback, all the channels and CIQ (Critical Incident Questionnaire) and so on, that we've talked about many times in the past. So those were the four ways that I wanted just to say, I respond to that particular sub-question.

J. R.: That's very helpful! In *Becoming a Critically Reflective Teacher*, you actually ask a lot of probing questions that we have reproduced in the following question. "How does the institution authorize positional power? When do students think teachers exercise their power in helpful and ethical ways?" We may have partially addressed that. "When do they judge teachers to be acting in arbitrary and unjustifiable ways? What happens when teachers attempt to 'give away' their power and work in a student-centered fashion?" (Brookfield, 2017, p. 27)

S. B.: How does the institution authorize positional power? I guess that happens by the conferring of titles, by requiring that you call someone 'professor' and by students knowing that if push comes to shove, if there is a conflict between a student and an instructor, institutional power will always side with the instructor unless there is something in the student's position that threatens a wider institutional interest. But typically, the institution authorizes power by the system, constantly placing all decisions in the hands of institutional representatives, so there's very little chance for students to have any decision-making power: the grading, the choice of curricula, the conferring of the title of professor, the freedom to design assessment formats that students have to adhere to: those are all ways in which students are constantly reminded of who really has the power.

I wrote a paper, back in the 90s, with Ian Baptiste and its title contained a student's quote: 'Your so-called democracy is hypocritical because you can always fail us' (Baptiste & Brookfield, 1997). And that's the reality: students know that you as their teacher have the ultimate power to determine their fate. And so there's a constant reminder to them of how your authority has been conferred on you by the institution. When the students think that teachers exercise their power in helpful and ethical ways – I deal with this to some degree in *The skillful teacher* (Brookfield, 2015) and I keep coming back to that theme – some of the answers I hear from students are: 'it's fostering useful and productive learning', 'something that's really going to be helpful to me', or 'I think you're exercising your power in a great way, when you're modeling something for me'.

My work on critical thinking has been very influenced by students saying that the most helpful thing a teacher can do is model their own practice of critical thinking, and make sure to tell students that that's what is happening. So I think you use your power very helpfully for students when you model in that way. I think when you support students, you try and build up their self-confidence and say 'Come on, you can do this'. 'You may feel plagued by feelings of impostership, but here's the reasons why I think you're fully capable of writing this dissertation or passing this course'. Students speak very appreciatively of that behavior when they're looking back on their own autobiographies as learners. They appreciate it when teachers provide clarification and clear up confusion for students, or when they jump in to give a really good example. A teacher might say suddenly 'well, let's stop for a second. I've just found this online. Let me pull this up and show you this brief video'. And then the showing of the video helps communicate what it is that you've been trying to get across that students are confused by. Students will say often that this is a very helpful thing for teachers to do.

Also, lots of students have in Critical Incident Questionnaires over the years told me that 'when you stopped what we felt was an unfair exercise of power or an imbalance in participation', 'when you told somebody, I think we've heard enough from you', or 'No, I don't want you to speak right now because someone over here has been trying to get in', or 'when you point out the blatant inaccuracy of another student's comments' or 'when you don't let racist comments go unaddressed' – those are all things that they say is 'a good act of your power'. I read things from students saying 'I would have been disappointed in you if you hadn't intervened and done something at that point'.

When the students judge us to be acting in arbitrary and unjustifiable ways, when no rationale is being provided, when it seems like your decisions are just coming off the top of your head, being made in a haphazard and unplanned way, that often comes across as arbitrary. It might not be unplanned. But it seems that way to students if you don't really talk out loud the reasons for your actions in front of them, or if, when they ask for some help or clarification, you ignore those requests. If you are having students saying 'Hold on, can you go over this again?' Or 'can we revisit this requirement that you're asking us to complete in this course?' And you say 'No, we're done with that'. I think ignoring a request to address student concerns is seen as an unjustifiable and an arbitrary way of working.

Another example is when you clearly play favorites in the classroom, and it becomes clear to a group that there are certain students you like, and you will give them the floor, and there are certain students that you dislike, and you're constantly trying to marginalize them. Students know, in my experience, that's what's going on. And that's another way when I think you'll seem to be operating in an arbitrary and unjustifiable way.

And what happens when teachers attempt to give away their power and work in a student-centered fashion? We've kind of dealt with some of that under the empowerment question. Sometimes when you try and move into that less structured, freer environment which depends more on students taking control of knowledge production that is sometimes fiercely resisted. Because (a) it goes against the institutional norms about how learning is supposed to happen that students have picked up and (b) it takes a lot more energy on their part, because now they have to become active agents making decisions and they feel that's your job, you should be doing that as this is what you get paid to do. 'Why are you asking us to be involved in creating a curriculum, you're the professor, you've got the expertise, you hold the doctorate, you can't expect me as a novice to be an equal co-designer of curriculum'. If students have been strongly socialized in a way of learning such as students from Confucian cultures who come to the United States used to following instructions and revering authority and are then suddenly told US higher education is all about collaboratively thinking critically, questioning authorities and the canon and so on; for those students this is very hard to make that transition and it takes a long time.

Judging when and how to encourage greater independence of thought and challenge to authority is so contextually dependent, primarily on how much the students know you. You can work in those ways if there has already been a relationship of trust and familiarity developed. But it's not a singular, monolithic response. Usually, I found when you do this, there are some students who love it. But there are also some students in the same group who really resist it. So it's not like you're dealing just with resistance or just with acceptance, the reactions are really all over the place. In terms of teaching well, you've got to keep researching the student experience, constantly monitoring what's going on, what's happening to them, explaining the steps of your process along the way. So that's the only thing I would add in terms of moving towards a more empowering stance.

J. R.: Thank you! In his debate with Noam Chomsky, Foucault said "The real political task in a society such as ours is to criticize the workings of institutions that appear to be both neutral and independent, to criticize and attack them in such a manner that the political violence that has always exercised itself obscurely through them will be unmasked, so that one can fight against them" (cited in Chomsky & Foucault, 2015, p. 41). Could you please share some of your personal experiences in criticizing institutions?

S. B.: I think when you do this, you shouldn't be naïve. You should understand that it will come with a cost more

often than not. As I think about ways that institutions have responded to me personally, or also when I think about colleagues who have publicly criticized institutions and held them to account, what's happened to them, there are certain very predictable things that go on. The institution has a lot of power to report and disseminate and frame your criticism, and they control often the means of information dissemination. So for example, if you as a faculty member are unable to send a mass email to everybody in your institution (which has happened to me), because the capacity to do that has been removed, then [laughs] you're immediately at a disadvantage because you can't get your criticism out or you can't address misrepresentations of your criticism. Because one thing that an institution will do will be to rewrite whatever history lies behind what you're criticizing.

I've been involved in situations where a public record about my particular work has been systemically changed by an institution, so it's literally rewriting history. Then another thing that they will do is try and gaslight you, and by gaslighting I refer to the 1944 Ingrid Bergman movie Gaslight, where you try and convince someone that your criticism is inherently irrational, that you're not seeing the world properly and therefore, it doesn't really have any validity because you're just imagining it. You're making things up. They will do what they can to invalidate the legitimacy of your question. They will try and keep you isolated and stop you disseminating your pushback. Again, this is channels of communication to colleagues. Because the longer they can isolate you and put doubts in your mind that in fact, you're seeing mythical things, you're not actually addressing real issues. That's one way, psychologically and individually, an institution can break you down and sap your morale.

A third typical thing I've seen happen is to remove people who speak out, who are in some position of influence as in-charge of a committee or a task force, not fire them, but remove them from a position of institutional influence. I've seen that happen a lot.

A fourth thing is to change the duties of the person doing the criticizing, so that they're now reassigned or overburdened with work that will sap them of any energy they have to make their critical agenda public. So I've seen a lot of that kind of work reassignment and experienced that myself over the years. So those are some typical responses that I've experienced and I've also seen other people experience, which is why I keep coming back to this importance of political education, that you need to learn how to become a political actor as a teacher, particularly if you're interested in power of challenging authority in any way. So you have to first of all know how to build alliances, draw this political power map of an institution, work out who you need to talk to and get behind you, work out who has a like-minded position on a particular issue and just informally ask them to go to coffee, and you build relationships and that building of alliances is a basic lesson in keeping yourself employed.

Secondly, the way that you use institutional language, the mission statement, the way you invoke and approve symbols is very important. Because if you hold people to account, and you frame it as how is what you're doing contributing to our mission, that's a much harder thing to wriggle out

Figure 8: Theatrical release poster for the movie *Gaslight*. Public domain. Source: Gaslight (2022).

of than just critique for the sake of critique. So you always frame it in terms of the mission. Or if you have a new idea that you think people are going to react against, tie it to 'I think, if we do this, or we consider this curriculum or make this change, it will help us realize what we say is our mission, to help us exemplify what we say we're even more'. So you always frame it in that way. I think that you build deviance credits, as Ira Shor called them, so you do things that build a reputation as an institutional loyalist. You serve on alumni committees, you help in fundraising, you cheerlead for the organization so that when the institution wants to gaslight you, it's harder because you have this history of doing publicly supportive things for the institution. So the deviance credits are nice to have in the bank, as it were. You have to be good at picking your fights. You have to know what is potentially winnable, distinguish between wars and battles and then specific skirmishes, because we only have so much energy. So you've got to kind of decide where am I going to use my energy because it's usually a draining thing. And you have to understand that you're not going to get sometimes as far as you would like.

I've seen these things work in helping people stay with critique longer than if they just go solo, or they don't attach at all to what the mission says it's about or they don't research

the history and realize that discussion around this happened five years ago. If you introduce a new issue, and you come across as 'this is the first time the institution has addressed this', but in fact, to those who were around, we talked about this five or ten years ago, you lose credibility. So you got to do your research and be politically smart as well as having all the command of curricular content that you need to have as a teacher. And also, the ability to work in a good pedagogical way, which we would define as teaching well. Aside from those things, you also need political acumen.

J. R.: That's very wise advice. Thank you very much!

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A review of Quizizz – a gamified student response system

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Introduction

The purpose of this EdTech review is to highlight the main features of Quizziz as an online tool for formative assessment. It can be used during online or face-to-face delivery and both synchronously and asynchronously. Quizizz is a gamified student response system that has been available since 2015. It was created by a homonymous startup based in Bengaluru (India). By end-2020, Quizizz had more than 65 million monthly active users in more than 150 countries (Naik, 2020).

Contributors to the *Journal of Applied Learning & Teaching* have reviewed a variety of student response systems and interactive tools for student engagement over the past few years: Mentimeter (Rudolph, 2018), Kahoot (Yeo, 2019), Nearpod (Burton, 2019), the now-defunct Zeetings (Stafford, 2020a), Google shared files (Stafford, 2021) and Padlet (Shuker & Burton, 2021). Such Web 2.0 tools have of course also been reviewed elsewhere: for instance, Mentimeter in Gokbulut (2020), Hill (2020), Kuritza et al. (2020), Mayhew (2019), Mayhew et al. (2020) and Moorhouse & Kohnke (2020)). We also cannot claim to be first in reviewing Quizizz (see Basuki & Hidayati (2019); Chaiyo & Nokham (2017); Junior (2020) and Zhao (2019)). Our review, however, adds to the existing literature by sharing our personal experiences with Quizizz and by providing a relatively detailed description of how it can be used beneficially, especially for multiple choice questions.

We start off with our rationales to use student response systems such as Quizizz. In essence, we strive to increase student engagement and help our participants to learn better. The aim is not to only engage those students who tend to be interactive in any event, but ideally all of them. Thereafter, we describe in some detail how Quizizz can be used and set up. Our discussion of how to use Quizizz focuses especially on multiple choice questions. Towards the conclusion of the article, we briefly compare Quizizz with Kahoot. Quizizz is a useful tool that adds to the toolbox of higher education teachers. We recommend to use a wide variety of methods to help our participants learn. These methods are certainly not restricted to software and, for instance, also refer to the mix of lecture and discussion (and the use of different discussion protocols: Brookfield, 2012, 2016).

Rationales for using Quizizz in an online environment: student engagement in light of the non-use of cameras and microphones

In this section, we share our thoughts and approaches to students' not using cameras and microphones as much as hoped for. As a result of our not seeing and not hearing most of our students, it is important to 'see' and 'hear' them in different ways. Quizizz is but one of the many ways that we can engage our students in an online environment (and it is also suitable for face-to-face delivery).

One of Alfred's major challenges in his initial online teaching was student engagement. Being relatively new to teaching, he had been cautioned by other lecturers that student engagement in our context of tertiary education in a private education institution in Singapore was an uphill task, especially in the online delivery mode (that had become the 'new normal' in Singapore since April 2020, no thanks to the COVID-19 pandemic: see Tan et al., 2022). A face-to-face teaching and learning environment is oftentimes perceived as making student engagement easier: after all, one can see the (at least in a pre-COVID environment, unmasked) students and to some extent, gauge their responses by observing their body language (e.g. facial expressions and eye contact). In contrast and in our experience, students often turn off their video cameras. Consequently, we are unable to use body language cues and we must obtain additional feedback on our students' experiences. However, a cautionary note is in order: body language and facial expressions are unreliable, as it is impossible for instructors to look into the minds of their students, and some students may pretend to understand something (for instance, through vigorous nodding) and others may just play-act behaviours

and emotions such as attentiveness or amusement.

A discussion of the use of students' cameras is worthwhile in our context of attempting to engage our students. Initially, Alfred gently nudged his students to turn on their cameras during lessons, but their compliance was usually short-lived. Some would turn on their cameras upon request before the start of class, but turn them off again soon after the lecture commenced. A particularly creative form of protest was the practice by some participants to position their cameras to face the ceiling! Another amusing instance of student creativity was that a student uploaded a short video on an endless loop that showed him walking around at home, preparing food and drinking water etc. During the lesson, Alfred asked that student for inputs, but there was no response from him although Alfred could still see him walking around the house. Another student helpfully pointed out that he was not there physically, but that Alfred and his students were looking at a recorded video. So much for students' technological ingenuity and 'passive resistance' to being surveilled!

A typical PC or laptop monitor can show 25 students at any one time using the Zoom platform (see Stafford, 2020b). Whilst this is insufficient for seeing all participants of larger classes, this number is further reduced significantly when the instructor begins to share their screen. Other platforms such as Blackboard Collaborate have similar limitations. At first, Alfred was adamant in checking regularly whether students kept their cameras on, but he quickly realised that precious time was wasted while making these regular checks. Moreover, students who wanted to learn more were put off by the regular intervals of roll calls and awkward silences resulting from non-responsive students. After continually trying to get students to be less camera-shy over a couple of initial sessions, Alfred eventually reminded himself that it was not his role to police his students or to catch 'wrong-doings', but to inspire and engage them. He henceforth decided to focus on the big picture and to give students the benefit of the doubt – that although their cameras were off, they could still be attentive and follow the session.

Jürgen's experience with students' cameras is similar, yet also different. Similarly to Alfred, Jürgen was also initially asking students to turn on their cameras. This was usually not adhered to, or just for a short time, as in Alfred's experience. The differences are twofold: first, Alfred's students can be described as pre-university students who are being prepared to enter a proprietary diploma programme (which is equivalent to the first year of university studies). Jürgen's students are Bachelor (equivalent to second and third year) students and Master's students and there is a difference in age, experience and maturity. Especially Master's students have often the 'gift of the gab' and are comfortable to, and eloquent in, presenting their views while on camera.

Secondly, there is a cultural difference in our approaches. Alfred is Singaporean and his upbringing and schooling took place in an environment that can be described as comparatively strict, where the teacher is a relatively unquestioned authority figure. Although he has spent more than half of his life in Singapore, Jürgen retains much of his German cultural identity. Already as a young teenager, he was influenced by more anti-authoritarian and 'liberal', democratic approaches. As a result of these formative influences and also due to continuous reflection of what he does as a teacher, he has a rather democratic understanding of learning and teaching. He is very much aware of his teacher power and uncomfortable with the power asymmetry in the classroom. As a result, he tries to reduce the power asymmetry between his students and him and to use his teacher power to the benefit of the students (see Brookfield et al., 2022). Hence, Jürgen has arrived at a laissez-faire approach to students' turning on their cameras. A partial exception to that approach is during student presentations where he shares with the students that it is a good practice to have their cameras on, though he still accepts it if they remain off.

We are in full agreement that it is not the teacher's role to police the students. We are aware of other teachers who in an authoritarian or charming way require that students' cameras are on during attendance-taking and then (quietly or not) hope that cameras will not be switched off. Jürgen does not believe in roll calls as they remind him of military practices (that in his view, have no place in education) and as he believes that he and his students can do more interesting things with their limited time. He can simply check the attendance by looking at the list of participants that are logged in.

Jürgen is also wary of the kind of surveillance that is omnipresent in the panopticon. The idea of the panopticon goes back to Jeremy Bentham's creation of an 'ideal prison' that featured a central tower with cells surrounding the tower in a backlit circle, an arrangement that allowed a central supervisor located in the tower to observe each and every one of the prisoners in their cells. In *Discipline and punish. The birth of the prison*, the French philosopher and historian Michel Foucault (1995) developed the concept of the panopticon further into a general model that illustrates the effect of disciplinary technology in everyday life. In its various forms, the panopticon serves to treat patients, to instruct students, to confine the insane and to supervise workers (Foucault, 1995). Due to the panopticon, prisoners/patients/schoolchildren/workers become complicit in their own domination: they behave as if they are constantly under surveillance and consequently conform their behaviour to the norm. The panopticon's modalities have been greatly enhanced in the past decades by the advent of the world wide web and social media, leading to an age of surveillance capitalism (Zuboff, 2019). Stephen Brookfield has discussed the metaphor of the panopticon in the context of higher education (see e.g. Brookfield et al., 2019, 2022). For instance, what is wrong with a participant lying on the floor and closing their eyes, if it helps them to listen closely to a lecture segment – especially online, while escaping the panoptic gaze?

Anecdotal evidence shows that students in Singapore (and other Asian countries) are usually reluctant to turn on their cameras during synchronous online classes, and few undergraduate students like to turn on their microphone and speak to the whole class. This does not necessarily mean that students are passive in a one-way banking model of education (where students are containers into which

educators pour their knowledge: Freire, 1993). The 'everyone' chats on Blackboard Collaborate and Zoom have been very active in our classes (and the digitally native students also chat with each other during class privately, especially when they are working on a group assignment).

There are many reasons for students' reluctance to turn on their cameras and use their microphones: poor Internet connectivity/bandwidth issues (this can be a problem for students even in high-bandwidth Singapore, and it is especially a problem for students in other countries, like for instance in China, Indonesia and Burma); an inconvenient physical location (for instance, a crowded study space, with family members in the same room – this could be framed as a social class issue); being 'shy' (a cultural issue); preferring to be in very casual attire and thus 'less presentable' (also in terms of personal grooming); and preferring to 'multi-task' while attending class; not turning on the microphone may be due to the microphone not working or a noisy environment (see Harvey, 2020; Moses, 2020; Terada, 2021).

The relative non-use of students' cameras and microphones in an online environment amplifies the problem of student engagement and the question how we can be sure that students appreciate the content discussed during class. To some extent, interactive lecturing (Barkley & Major, 2018) is the answer. In an Asian, largely Confucian context, asking students questions does not always elicit many answers. A lack of preparation and also the Asian culture of not wanting to 'lose face' (Bodycott & Walker, 2000) by saying something inaccurate oftentimes leads to a relative lack of participation in class. Repeated exhortations by the lecturer to participate could lead to antagonizing at least some of the students.

Students may be shy to turn on their microphones – especially initially and at the lower levels of higher education – this can be completely different in Masters courses, where participants often have a wealth of experience and expert knowledge that they are happy to share. Be this as it may, students are often fast in responding by using the chat box and to write text messages. There is a tendency that the responses are given by the same handful of students. Whilst there is no doubt that those interactive students grasp at least the gist of the content, it is unclear what is going in with the rest of the class? To what extent is the silent majority able to accomplish the intended learning outcomes?

This is where student response tools and interactive student engagement platforms (e.g. Kahoot, Mentimeter, Nearpod and Quizizz) are worthwhile exploring. Whilst Alfred was exposed to them during a recent course that he underwent – the Advanced Certificate in Learning & Performance (ACLP) programme by Singapore's Institute of Adult Learning (IAL) – Jürgen used his journey of becoming a Fellow of the Higher Education Academy (UK) as an opportunity to further experiment with student response systems. Jürgen is thankful to Alfred for introducing him to Quizizz and patiently teaching him how to use it well. We have found Quizizz to be an excellent student response system because it is user-friendly and free of charge. Especially for multiple choice questions (MCQs), it is the best platform that we know of.

Technophobes might argue that the participation that is achieved through tools like Quizizz can also be achieved by lower-tech means. Such an argument is not entirely ludicrous. Indeed, one can print out mock tests for students in a face-to-face environment or email them a file (or make the mock test available as a linked google doc). This is indeed what Jürgen, who would describe himself as neither technophobic nor technophiliac, used to do. In addition, Jürgen still intersperses his PowerPoint slide decks with questions – that can take the form of MCQs, but also more open-ended questions. While these are all valid pedagogical methods, tools like Quizizz add elements of fun (at least as perceived by many of our students) and gamification, as we shall see.

The vast majority of our students are digital natives, with technology being an integral part of their lives. Consequently, there is an opportunity to engage participants via Web 2.0 technologies that are perceived as engaging and motivating, and Gokbulut (2020, p. 108) goes as far as deeming it unreasonable to educate students "away from technology in traditional classrooms using traditional methods". Contemporary learners "need active, collaborative and technology-rich learning environments" (Gokbulut, 2020, p. 108). This is also where the gamification element of Quizziz comes into play, allowing learners to gain knowledge by leveraging entertainment and weaving it within learning environments (Bawa, 2019). There is evidence that game-based learning can improve engagement, motivation and achievement, and this kind of gamification can be used as a formative assessment tool (Bawa, 2019; Göksün & Gürsoy, 2019).

An introduction to the main features of Quizizz

A freely-available, basic Quizizz account provides adequate features with several quiz formats to choose from (see Figure 1). It can support up to 100 participants for live quiz sessions, and a leader board is available for screen-sharing after the quiz has been completed by the students.

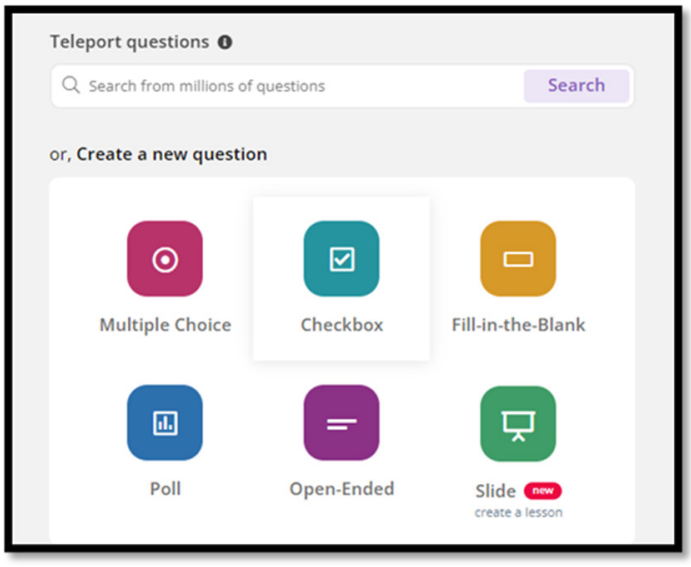

Figure 1: Modalities available in Quizizz.

A main objective for using an online tool such as Quizizz is to monitor students' level of understanding of the module content. Amongst other features, Quizizz offers a detailed analysis of students' scores. It provides the participants' average score, participants' score charts in leader board style (see Figure 2), time taken to answer each question and problematic questions which confuse students (see Figure 3). This information allows the lecturer to monitor their progress across each topic and enables them to render targeted help for students who are struggling with the quizzes. Quizizz allows educators to test students' knowledge and understanding of a topical segment. Students who are informed beforehand of an impending quiz, are more likely to pay attention during class, so they could do well in the quiz after class.

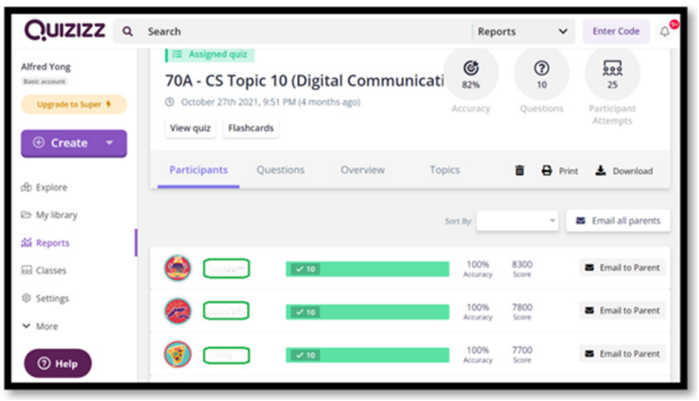

Figure 2. An example of a Quizizz leader board.

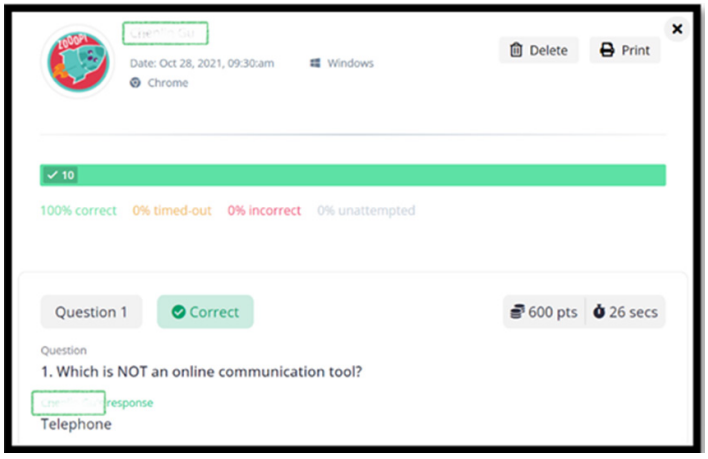

Figure 3. An example of an analysis of an individual question for each student within Quizizz.

A big plus of Quizizz is that it is free to access, both for students and the teacher. It supports the creation of assessments for any topic and provides various reporting formats to shed light on students' understanding and the questions they struggled with. The report feature in Quizizz allows educators to further clarify certain difficult concepts in subsequent lessons and to rethink learning and teaching strategies for future delivery (see Figure 4).

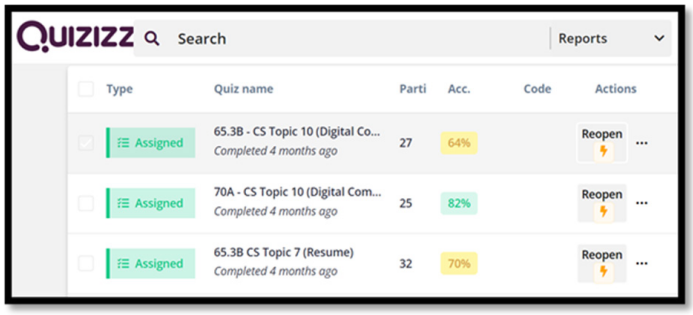

Figure 4. Past reports of quiz results.

When Quizizz is used frequently, educators could collect data and make comparisons across topics taught to different cohorts. These data, stored in the Quizizz reports, give a breakdown of individual students' scores and results are downloadable in Excel format. Interventions can be arranged for students who had low scores for several topics. Educators can choose to encourage students to join Quizizz by using their first name before attempting a quiz. Some students who are ill-prepared for the quiz and thus compelled to make wild guesses are usually reluctant to disclose their identity. It is debatable whether educators should playfully read out the pseudonyms found on the leader board (see Figure 2).

Creating a Quizizz account is simple and free. It can be done via an existing Google or Microsoft account. Once logged in, select "Create", "New quiz" and you will receive pop-up boxes to guide you in setting up an account. Next, tag the quiz to a subject (see Figure 5).

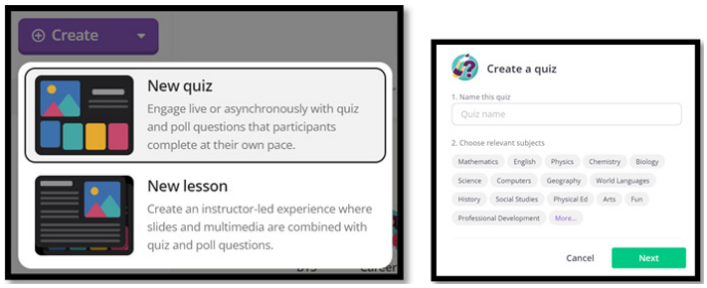

Figure 5. Create a quiz and tag it to a subject.

You could design your questionnaire by selecting from the six quiz formats available (see Figure 1). It is a strength of Quizizz that a different question format can be selected for each question. We have found the MCQ format particularly useful.

The crafting of multiple choice questions (MCQs) is a topic that goes beyond the confines of our article. MCQs have the advantage that they can test a broad range of content. But they are also associated with 'shallow learning', as in the real world, answers are usually not right or wrong, but oftentimes in a grey area. Thus, it would be ill-advised to have too many MCQ assessments, as they do not foster critical thinking and it is important to be able to argue for one's opinions and positions (Chandratilake et al., 2011).

Within Quizizz, each multiple choice question allows for a maximum of five choices. A green tick in the top right corner of one of the choices indicates the correct answer (see the red arrow pointing to the green tick in Figure 6). Whilst MCQs usually have only one correct answer (this is in our view a major issue with MCQs), Quizizz allows for the selection of "more than one correct answer" (in the jargon of quantitative research, this type of crafting questions is called a 'checklist'; see Figure 6).

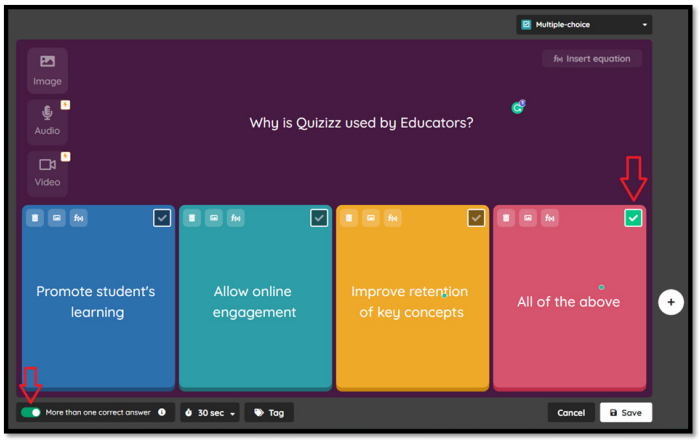

Figure 6: Inputting question and answers.

It is possible to add images to aesthetically enhance the questions and possibly add an element of fun (see Figure 7). Your choices can have images, too. Once you are satisfied with a question, click 'save'.

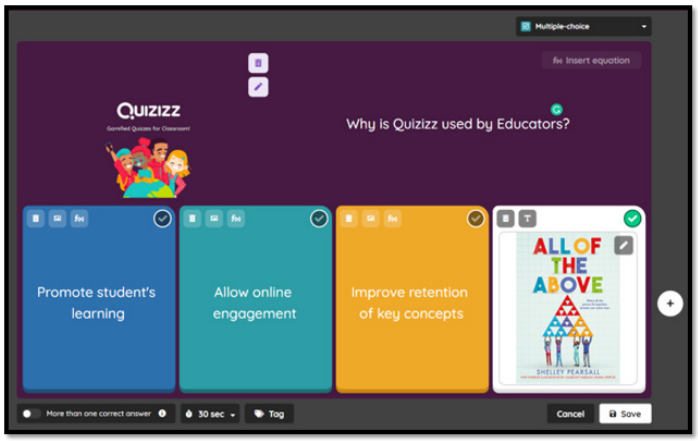

Figure 7. Adding images to question and answers.

With reference to Figure 8, the next window brings you back to the main page where you can add your second question. After all the choices are added, click on the "save button" at the top-right corner (see Figure 8).

You will be prompted to add an image for this set of questions and tag it to one language (e.g. English) and one 'grade' (e.g. University). Then select "Public, visible to everyone", so your students can participate in your quiz.

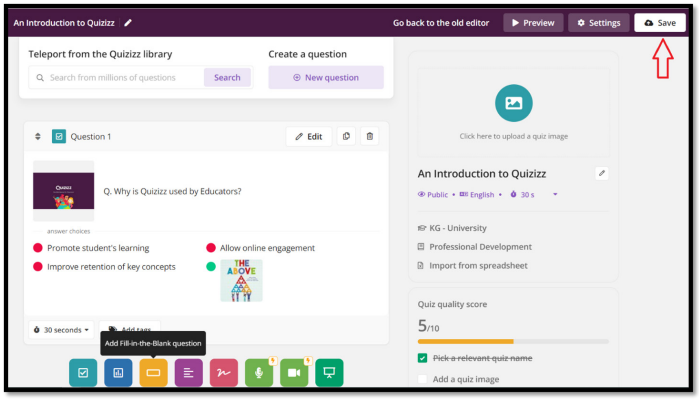

Figure 8. Main view of all your questions.

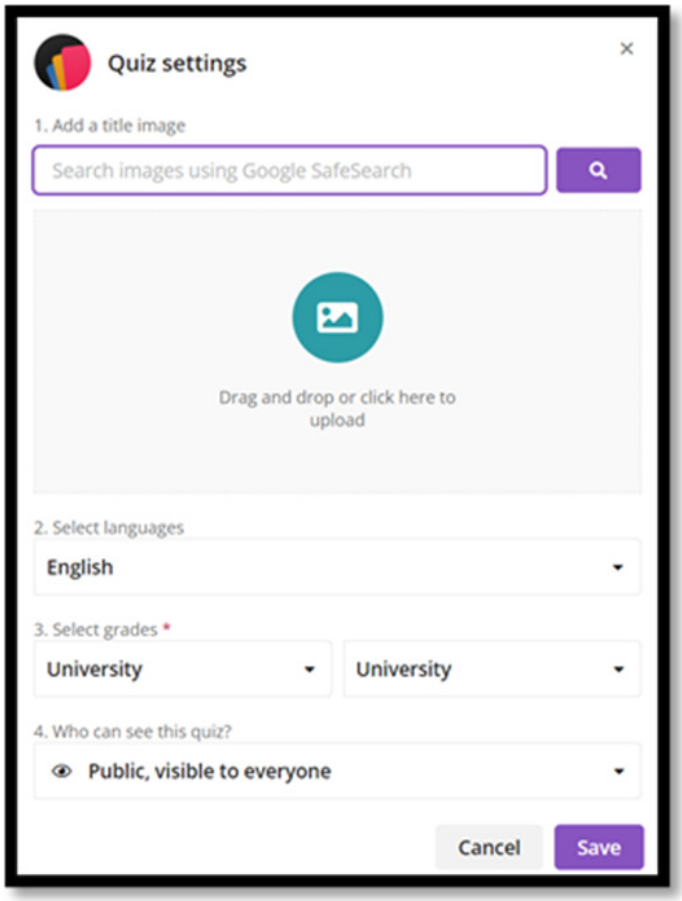

Figure 9. Quiz settings.

After saving the quiz, you have two options to conduct the quiz: "start a live quiz" or "assign homework". Starting a live quiz enables students to join a live session where students progress at their pace ("classic"). Alternatively, the instructor controls the pace. The "assign homework" option will enable you to assign the quiz as a homework where students could attempt it multiple times over a certain period of time (for instance, during the next two weeks: see Figure 10).

Our preference is to "assign homework" and at the same time to conduct the quiz live with students during the online session. You select "assign homework" and input the quiz duration. There are some options to select (e.g. show leader board, shuffle questions), so take your time to go through them (see Figure 11). So-called "power-ups" are but one

of the gamification elements. They are single-use abilities designed to increase engagement and participation and they come, for instance, in the following forms: "double jeopardy" (get double points for a correct answer or lose all points if you choose the wrong answer), "x2" (get twice the points for answering correctly), "50-50" (half of the incorrect options are eliminated), "eraser" (one wrong option is eliminated), "immunity" (two attempts are allowed for answering the same question), "time freeze" (timer is frozen to allow players to answer one question), and "power play" (all players in the quiz get 50% more points in 20 seconds). Click on "assign" when done.

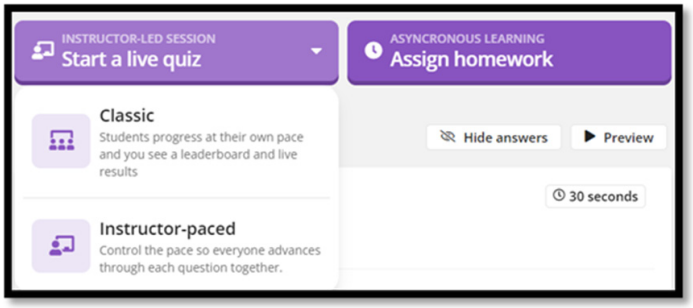

Figure 10. Quiz delivery modes.

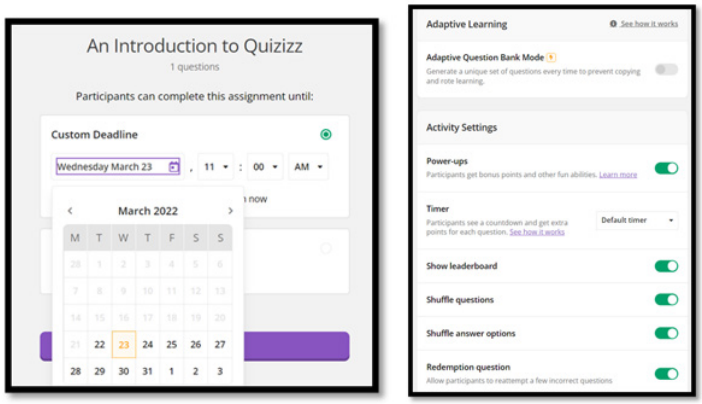

Figure 11. Quiz duration and settings.

There are several ways to conduct a quiz. We recommend to copy the link and paste it into the chat box (so that students can just click on it) and into the lecture slides which you are using for the session (see Figure 12). Alternatively, at the start of your lecture, you could retrieve the quiz from Reports, after having logged in (see Figure 13). Select the correct quiz and it will show the number of participants who joined it.

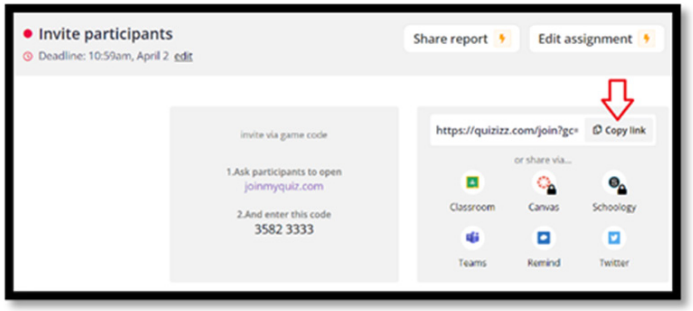

Figure 12. Copy quiz link.

Figure 13. Retrieve a quiz from Reports.

One possibility is to give students ten minutes to complete ten MCQs after a lecture segment. Jürgen likes to conduct several no-stakes, formative quizzes especially for modules where a significant percentage of the overall assessment weightage consists of online MCQ tests. In such cases, Quizizz helps prepare for the summative online tests.

The instructor copies the Quizizz link and shares it in a chat box (e.g. in Zoom or Blackboard Collaborate). A simple click on the link enables students to input their names and begin the quiz. They attempt the quiz live for the next ten minutes at their own pace, while the instructor may choose to monitor how many participants have signed in and completed all MCQs (see Figure 2).

After the time is up or when all are done – whichever is earlier – we recommend for the instructor to go through the correct answers with students by screen-sharing the questions and answers and expelling possible misconceptions and misinterpretations associated with the wrong choices. Knowing the overall performance per question enables the instructor to place more emphasis on questions which many students answered wrongly (see Figure 14).

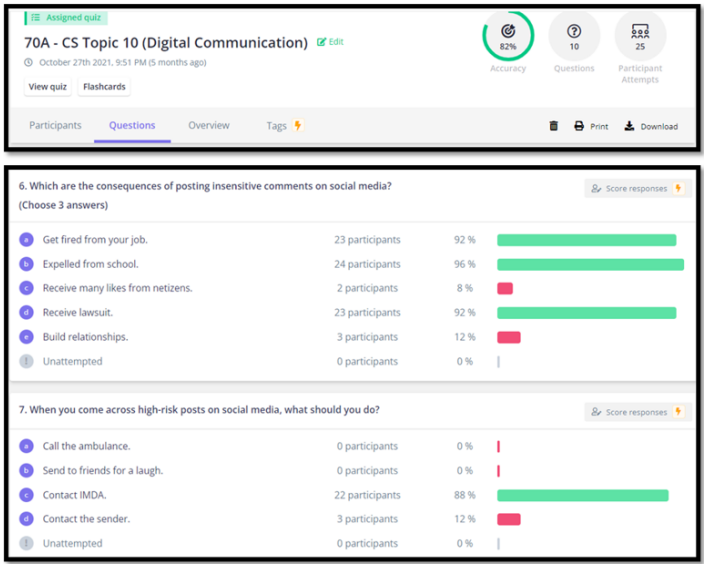

Figure 14. Screen-sharing of correct answers for discussion purposes.

The instructor can choose to show the leader board after the quiz, for instance to highlight students who scored 70% and above. Alfred recognises these students for their laudable efforts and congratulates them. He does not share the leader board for students who scored below 70%.

Students have provided fairly unanimous positive feedback that they enjoy Quizizz quizzes. For instance, Jürgen has conducted polls where he gave participants yes-or-no choices whether they like Quizizz and depending on the class, he has received 100% positive responses or close to that. Alfred observed that students felt a sense of achievement when they had done well and their names were mentioned. Students typically describe Quizizz as fun and meaningful as the quiz enhances their understanding and improves their knowledge of the tested content. Jürgen uses Stephen Brookfield's Critical Incident Questionnaire, a one-page, five-question response sheet that students are requested to fill in anonymously during the last five minutes of class (Brookfield, 2013, 2016, 2017) at the end of most of his classes. Students' responses to the questions "at what moment in class did you feel most engaged with what was happening?" and "what action that anyone (teacher or student) took did you find most affirming or helpful?" usually make prominent reference to the positive experiences with the Quizizz quizzes if and when he conducts them.

As an aside, one of Alfred's students amused him by asking if the results would be shared to parents because he saw this option available in the leader board (see Figure 15). This is one option provided by Quizizz that is less useful in the context of higher education.

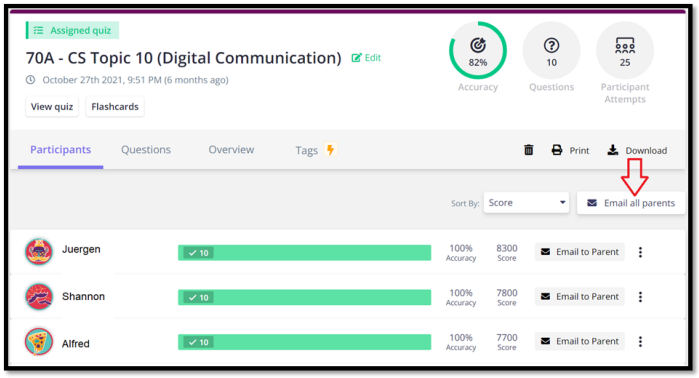

Figure 15. Option to email to parents.

Accessing Quizizz is easy and is possible even if bandwidth is suboptimal. We have had students from a variety of East and Southeast Asian countries (Singapore, Malaysia, Indonesia, Vietnam, Burma, China and South Korea) successfully participate in Quizizz quizzes for the past year. Some students might be reluctant to take part as they may not feel confident about the topic or they may have been distracted during the session. When doing Quizizz for the first time, it may be useful to carefully explain how it works, to conduct a quick poll whether it works for everybody, wait till everybody is on board and to encourage participants that this kind of interactive activity will help them prepare for assessments. In the unlikely event that somebody faces insurmountable technical problems with the Quizizz platform, it can also be considered to provide the questions differently as a fallback, for instance as a google doc or in PowerPoint form.

A comparison between Quizizz and Kahoot

There are a large number of online tools to consider for setting up a virtual quiz. As many of our readers are aware, Kahoot has become a household name for gamified learning. There are studies that arrive at the conclusion that Kahoot is preferable to Quizizz. For instance, Chaiyo and Nokham's (2017) study of Thai nursing students compared Kahoot, Quizizz and Google Forms in terms of students' concentration, engagement, enjoyment, perceived learning, motivation, and satisfaction. Kahoot did marginally better than Quizizz in the Thai students' perception, with both gamified student response systems significantly outperforming Google Forms (Chaiyo & Nokham, 2017).

The study by Göksün and Gürsoy (2019) also arrives at results that favour Kahoot. The authors compared success and engagement in gamified learning experiences via Kahoot and Quizizz. Their experimental research of pre-service teachers in Turkey came to the result that

> "the impact of Kahoot-based instructional activities on academic achievement and student engagement was higher when compared to that of the control group. On the other hand, the educational activities that were conducted with Quizizz were less effective when compared to the control group. Limited visual feedback capacity of the Quizizz application, the fact that the questions progressed at an individual pace and the individual technological problems experienced by the participants may have prevented academic achievement and student engagement as demonstrated by the qualitative findings" (Göksün & Gürsoy, 2019, p. 26).

Nonetheless, Göksün and Gürsoy (2019) observed that students liked both Kahoot and Quizizz in the classroom and, concurring with Bury (2017), attributed that as being due to students' preferring strong stimuli or receiving immediate feedback on their test performance (Göksün & Gürsoy, 2019).

However, our own anecdotal evidence and other research (Basuki & Hidayati, 2019) show that Quizizz has certain advantages over Kahoot. Amongst other things, the free version of Quizizz allows for more questions than Kahoot. Also, there are no character limitations for Quizizz, whereas for Kahoot a question cannot exceed 95 characters and an answer can have maximally 60 characters (Göksün & Gürsoy, 2019). Perhaps most importantly, Quizizz has impressive features in their free version, whereas that of Kahoot only has very basic ones. Kahoot's type of quiz format is limited to "Quiz" and "True or False" (see Figure 16). To open additional quiz formats, a fee is required. The free version of Kahoot allows for only up to ten players. The next membership tier (Home) allows for up to 20 players. For educators with more than 50 students, the "Max Plan" is the only option. Finally, the music that comes with Kahoot can be perceived as childish or overly dramatic and thus stressful and distracting – of course, it can be muted.

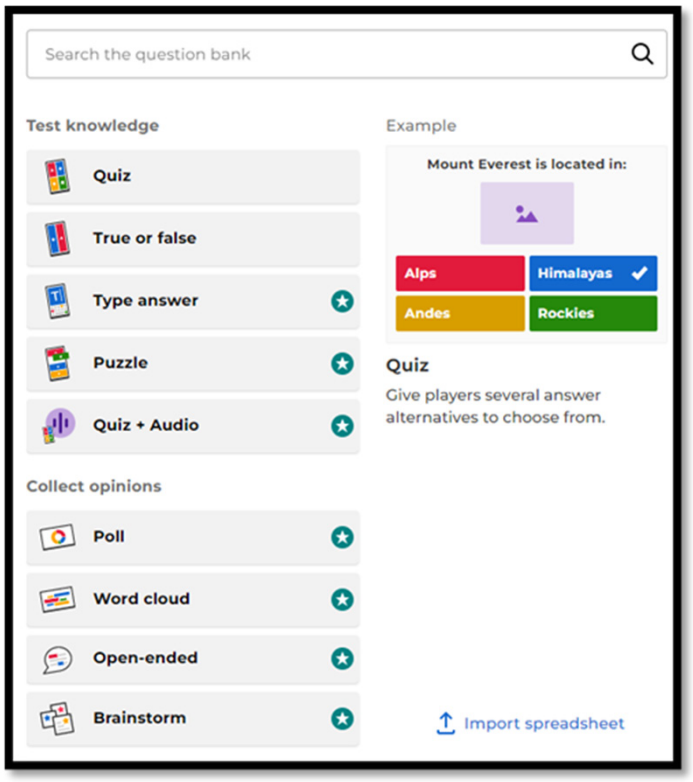

Figure 16. The limited quiz options for a basic Kahoot account.

Conclusion

To us, technology is a mere medium, enabler and tool (Kefalaki et al., 2022). In order to avoid 'death by PowerPoint', a variety of learning activities may stimulate students by doing interesting activities that can occasionally come with gamification elements. In Quizizz, students can see how well they did and they can compare themselves with other students; there is also a countdown element which we advise them to not focus on. Using, for instance, only Mentimeter could become as boringly repetitive as always using PowerPoint. Hence the use of a wide variety of technology – such as, for instance, Quizizz, Padlet, polls, the Blackboard Collaborate-integrated whiteboard and showing the occasional video clip – as well as different teaching & learning approaches (interactive lecture, discussion, brainstorming, Q&A, MCQs, Critical Incident Questionnaire) address heterogeneous learning styles and enable a varied learning experience.

In conclusion, we are fans of Quizizz because of four aspects: (1) it is free of charge for teachers and students; (2) it offers great features, especially for setting MCQs; (3) it is easy to use; and (4) our students enjoy Quizizz and it appears to have improved their test performances. Quizizz quizzes provide a formative assessment opportunity as well as useful feedback on students' knowledge. When MCQs get answered largely correctly, these questions require less discussion and explanation. However, those where students struggle provide an opportunity to explain the rationale for the correct answer in more detail.

If you have any trouble with experimenting with Quizizz, we hope that the introductory description in the third section of our article will be helpful to you. If all else fails, you may wish to consider asking one of your millennial students for help and they may be able to explain everything with great ease. After all, many of them are digital natives.

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Post-COVID-19 and higher education[1]

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Abstract

The COVID-19 pandemic is a perfect storm to encourage higher education institutions (HEIs) to think differently, to price in risk and review their purpose of existence. This paper examines two thoughts as HEIs transition to a new normal life with COVID-19 – the first relates to the future of online education in higher education and the second pertains to the relevancy of degrees. It argues that transition to any model of cognition and enquiry, including online delivery of courses, needs careful consideration, and must be weighted with its limitation. Academic credentials serve as the foundation to determine if a decision is worth embarking. Devoting resources to strengthening the credentials of higher education qualifications will be essential in the post COVID period. For one, universities need to know that student centricity does not mean that the customer is always right in every aspect. Stepping up the effort to ensure that university degrees remain relevant will be one of the most significant challenges HEIs have to work on.

[1]An earlier version of the paper was presented at the *2021 Education Roundtable Singapore's PEI Sector and the Pandemic* organised by Singapore Association for Private Education (SAPE) Dean's Committee on 19 August 2021. The author is grateful to two anonymous reviewers of this journal for their constructive comments and suggestions. The views and opinions expressed in this paper are solely those of the author.

Introduction

The COVID-19 pandemic has created the largest disruption of education systems in history. Education is probably the second most impacted sector after health. Closure of schools is particularly painful in lower- and middle-income countries. Moving classes to online has been problematic due to poor infrastructure and lack of support to teachers in delivering their classes and tracking students' presence, leading to virtual dropouts and loss of learning[2]. As economies move to the new normal environment, it is timely to think about the way forward for higher education.

Two thoughts are put forward in this paper. First, many observers have predicted that higher education institutions (HEIs) will accelerate the effort to digitise learning. Online learning offers a personalised learning experience, moving away from the rigid curricula of the past where missing a lesson means great difficulty for students to catch up. For educators, we need to think carefully how technology can be integrated into our curriculum. While online learning may be suitable for some courses, it may not be suitable for other courses. Experimental courses require practical lessons and hands-on components to fulfil professional requirements. This may sound obvious, but with the current strong enthusiasm toward online learning, it is worth a reminder. The good news is that HEIs have gained valuable experience in online delivery. HEIs should reflect on their experiences and ask what they can do for academics and for students in the post COVID-19 era.

Second, it is worth reminding ourselves that the pre-COVID-19 challenges in higher education have not disappeared because of the virus outbreak. To take an example, HEIs have been accused of offering courses that are too theoretical, too specialised and that lack relevance to the job market. This continues to be a challenge. Increasingly, hiring companies are looking beyond education qualifications in deciding who to short-list and hire. Google, for example, does not hire people because of their educational credentials. What Google looks out for is the candidate's "learning ability"[3]. In computing, start-ups are much more interested in a 100 rating on GitHub than a programming degree from even one of the most prestigious universities in the world. Today, one's rating in GitHub is worth more than a college degree. HEIs would need to step up their efforts to ensure that the curriculum is relevant to meet 21st century expectations. This is particularly important as economies recover from the pandemic and companies prepare themselves for post COVID-19 recovery.

The analysis that follows is reflective and based on the analysis from various sources and practical grounds that the COVID-19 pandemic has forced the HEIs to embark to deal with a variety of problems. In other words, the paper is based on a combination of descriptive and analytical methods.

What is the future of online education for HEIs?

When COVID-19 hit in 2020, education institutions were compelled to make a rapid transition to online learning with little preparation or training. Instructors were unfamiliar with online teaching, adopting the same approach as in face-to-face delivery. Despite widespread use of digital tools, increased downtime and connectivity issues has raised concerns. Students failed to attend live synchronous lessons and were unable to complete the assigned tasks on time. Some students did not even own a laptop or a desktop and had to resort to learning via their smartphones. The negative mood was muted only because students were aware of the constraints faced by the institutions, but the loss of learning is unprecedented (see Whitley et al., 2021). As HEIs emerge from the pandemic, they will need to get more creative to prepare students for online learning with diversity and inclusivity in mind.

The issue of whether or not online education is the same level equivalent to face-to-face delivery remains controversial (see Table 1 which summarises the pros and cons of online education). The nature of the course matters. Some of the courses require greater engagement from students than others. While some students may want to have more online learning, they also do not want mere talking heads. They want interaction between instructors and students, and between students and students and debate issues in real time (see Sharma & Alvi, 2021 and Almendingen et al., 2021). Clearly, an acceptable transition to online learning does not mean that students and instructors are adapting to online format of teaching and learning, nor does it mean that online education is effective. Institutions and faculty may not have the knowledge of whether students' homes are safe and conducive for learning. Internet access, student learning support and good internet connectivity are not always possible. Studying and learning on the same device, which students use to play games and chat in the social media, leads to distraction and imposes challenge on the instructors to keep their students engaged. Students can get distracted

2 COVID-19 has left many people, especially teens, depressed, anxious, angry and uncertain about their future. Unable to go out due to lockdowns, students turned to social media, which have triggered high levels of envy, stress, and depression. In support of mental health, some institutions have provided personalised grading options with the flexibility to choose between credit and non-credit bearing modules and between pass/fail grades and letter grades. Others have emphasised more on early intervention measures with revision in academic procedures and policies to suit online teaching and learning mode, student learning support, change in the way students are assessed and tested and provision of equipment and software to enable students to continue to learn. See also Guo et al. (2020), Treve (2021) and Mok et al. (2021). The graduates face a weak jobs environment. Historically, graduates who started their career in a recession tend to experience lower earnings for 10-15 years after graduation or longer (see Schwandt & Wachter, 2020). Lower earnings translate to higher mortality rates, driven by disease-related causes such as heart disease and lung cancer because of stress, depression and unhealthy ways of living. Indeed, the adverse economic effects of technology on jobs would be more painful as compared to past events of technological progress. Korinek and Stiglitz (2021, p. 2.) told us, "When the economy is expanding and progress is biased against labour, workers may still experience modest increases in their incomes even though the relevant share of output that they may earn is declining. However, at a time when economic output across the globe is failing because of the effects of COVID-19, a decline in the relative share of output earned by workers implies that their incomes are falling at faster rates than the rest of the economy. And unskilled manual workers who are at the lower rungs of the earnings distribution are likely to be most severely affected".

3 Friedman (2014). Others like Apple and IBM have shifted their focus from recruiting candidates with degrees to those with relevant skills.
4 Some countries are more prepared than others. Singapore, for example, has been on a journey for a Smart Nation, laying the foundation to implement a comprehensive digital teaching and learning environment. For some analyses of Singapore's higher education sector during the pandemic, see: Crawford et al., 2020; Wilson et al, 2020; Kefalaki et al., 2021; Rudolph et al., 2021; and Tan et al., 2022.

by family members, for example, caring responsibilities for children and older family members. Often, students resort to using smartphones which are less effective in performing certain functions as compared to desktops or laptops. There is also the temptation to visit websites on the Internet. The knowledge that the lectures are recorded for viewing later contributes to the problem. The question, then, is whether or not there is a learning modality that can bring out the best in students and teachers.

Table 1: Pros and cons of online education.

Pros	Cons
1. Less worry about finding classrooms to conduct small group discussion. 2. Generally easy to invite guests to deliver online lectures. 3. Offers personalised learning – as opposed to rigid in-person teaching where missing a class makes it difficult for students to catch up and follow in subsequent lessons. 4. Allows students to study on their own – no peer pressure, no classmates, no teacher. 5. Students can be given tasks in the mall, community centre and elsewhere and discuss them in class. Online materials in the form of websites for self-learning and self-discovery can be provided.	1. Absence of invigilators and supervisors to monitor assessment online could be a major issue, although preparation of question banks, randomisation of questions, set assessment questions to test students' problem-solving skills may help to minimise cheating. 2. Teachers replicate how they taught in-person classes when they deliver online sessions. Online teaching is new to teachers. Faculty have to revisit the basic teaching skills like how to deliver a lecture or how to engage the students. 3. Structured curriculum cannot be neglected. Watching a couple of documentaries on marine animals will not turn us into marine biologists. Likewise, we cannot learn a programming language by just watching a few YouTube videos. To be literate about the subject matter, students must learn the principles, practice often and receive feedback and guidance in a structured way which in-person classes can deliver more effectively.

Despite the challenges, the use of digital and online technology in education will only keep advancing[5]. The use of online games or computer-based entertainment software to promote learning in schools will intensify, simulating real-world scenarios. With 5G technology coming our way, the continuing advancement in online learning is not only going to be real, but will soon become the norm. HEIs which are wealthy and reputable will adapt easily to the digital technology revolution. But there are less wealthy and less distinctive ones which will experience disruption, and there is a danger HEIs that resist the power of technology will be replaced by those which understand the power. Before the HEIs make any decisions to retain or extend online provision, whether it is in hybrid mode or otherwise, they should take the following into consideration.

First, HEIs should give some thoughts on the impending limitations of online education, including the lack of a digitally skilled educator workforce to facilitate online learning effectively. When the coronavirus caught the attention of the HEIs, many HEIs merely moved the in-person classes online and moved readings on the website, resulting in poor user experience for many students and staff. Some faculty replicate how they taught before COVID hit when they deliver the same modules online. Online teaching is after all relatively new to the teaching-learning community so there is no prior knowledge nor experience to rely on (see Selvaraj et al., 2021). Faculty members might have incorrectly assumed that their students would behave in a similar manner in the online learning environment as they would do in face-to-face learning – staying in the sessions the whole time, taking notes, and learning. But none of these behaviours remain the same under new and often challenging circumstances (Stafford, 2020).

Online learning should push educators to think about how they can deliver effective online lessons, for example, using strategies and techniques such as developing bite-sized lectures, utilizing the chat-box function on the Learning Management System (LMS) to encourage students to pose questions, delivering interactive lessons to capture the interest of the students, using analogies to make the contents easier for students to understand, encouraging group learning amongst students to build their confidence and using interactive displays and tablets to display mathematical expressions and equations. Virtual Learning Environments (VLEs) such as Canvas, Moodle and Blackboard can be used to provide individualised and generic comments. For written assignments, VLEs offer a useful platform to provide feedback and comments on individual work or generic feedback that can be posted in the chat group function for all students taking the module to read. Technological tools like Kahoot and Mentimeter can be effectively used to assess understanding of subject contents (see Yeo, 2019; Rudolph, 2018). Struggling students feel a sense of relief when they know there is help.

One of the factors contributing to the success of hybrid learning or blended learning in some institutions in the pre-COVID period was strong involvement of teaching staff in the process of combining teaching with technology. It was understood that the teaching faculty would lack the qualification and experience to deliver their lessons online. This was dealt with by providing intensive training and support to the educators. Santiago Iniquez de Onzono advised HEIs to conduct on-going training for the instructors as a way "to improve their ability to combine technology with educational delivery" and develop "new contents, formats, and network by making use of the growing number of new resources and relationships available through the Internet" (De Onzono, 2011, pp. 77-78). Educators who produced the teaching materials in the traditional setting should be assigned to work closely with technicians to develop online teaching materials. By teaching the materials they developed, there is greater accountability and familiarity, contributing to improved teaching quality.

Second, casting aside considerations of productivity and cost, quality of online education should translate into measurable desired outcomes such as learning gains of students through subject passing rates, on-time graduation rates and graduate outcomes. Collecting and analysing the data is key to improvement, to inform policy in the design, implementation and evaluation of institutional policies and regulations. Student outcome measurements like passing rates and on-time graduation rates provide an indication of the quality of course delivery and student and teacher support approaches, whereas graduate outcome data such

5 There has been a surge in interest in immersive virtual reality in education. For example, see Makransky et al. (2019), Tan (2019), Akinola et al. (2020) and Wu et al. (2020).

as employment rates and median wage salary measure the attractiveness of the students in the eyes of the hiring companies (see Bol & Van de Werfhorst, 2011; Rudakov & Roshchin, 2019). With regard to knowledge and skill acquisition, HEIs can measure the effectiveness of online education by comparing the preparedness of students in the first year of study who have enrolled into the HEIs during the COVID-19 period where classes and examinations were mainly held online and those who were enrolled in the pre-COVID 19 period where classes and examinations were conducted in-person.

Third, it is worth framing the issue around online technology as a tool to complement learning modalities. This way, the challenge is not so much about choosing between in-person and online classes but to ensure the best learning outcomes for our students. It is about finding ways to cope with technology and deal with its challenges so that our education system continues to do its job of imparting useful knowledge and skills to students. Maryanne Wolf (2018) suggests constructing a biliterate mind in our students, which is steeped in both traditional and digital mediums of communications. It is useful for students to be able to learn to think in each medium and develop and internalise the characteristics of the two mediums. Wolf illustrates with the example of a student who combines reading of stories and discussing about refugee children with online access to actual footage of migrant refugee children as one effective way to tap on both mediums to improve learning capacity. The Internet serves as a powerful tool to supplement traditional learning if it is used constructively.

Much effort is needed to alter the readings and assignments as well as style of teaching in the online setting to motivate and engage students. For one, teachers need to know how to use the online tools, gain an understanding of what learners do and how they learn online. The role of psychologists or counsellors is particularly important in this regard. They have the skill to facilitate communication and problem-solving procedures that are much needed in schools and in class. Psychologists/counsellors can work with school administrators, teachers and community leaders to plan and design an online learning environment, and as Carl Rogers (1995, p. 241) put it, to go beyond dealing with "the pains of the victims in the old system" but embarking "on the broadest tasks of building a flexible institution" with students "as the core and all others as the servants of the learners". Working through the approach may require giving substantial autonomy to the instructors to experiment with education practices including the nature of assessment suited for online delivery.

Relatedly, thinking about providing a purpose is essential. HEIs should ask, what is the purpose of the undertaking? Does transition to online or hybrid learning align with the institution's mission and vision? Does online education provide the necessary level of challenges to motivate students to learn and grow? Does the HEI want the students to learn passively by listening to lectures via online videos? Or do we want students to listen to the online videos to prepare before the classroom experience? Does online education and online assessment help the institution to better measure students' learning such as the ability to use what students have learned so that we can move away from paper-based examinations which typically measure memory? Is teaching online about giving an account or an opportunity for exchange of viewpoints? How receptive are the instructors in dispensing with their authoritative stand in favour of active online learning through dialogue and networking? Unless the stakeholders can trust the institution's commitment to its vision and values, the project will soon self-destruct. In contrast, if the institution is clear about the goals and the reasons for adopting online education, and is committed to improving the student learning experience, the project is more likely to flourish.

What can we do about credentials of higher education qualification?[6]

Before COVID-19, relevance of higher education has been a subject of intense discussion[7]. Credentialism emerged in the 1950s in the United States when it dawned on the nation that the key to economic development was the population's knowledge pool (Jacobs, 2005). *Knowledge is power* became the mantra, prompting the universities to launch courses and embrace skills that seemed needed to fuel economic growth and meet the demand of the employers. As the student population grew, students noticed that they were not getting personalised attention from the instructors because of the large class size. Structured curriculum and assessment led to passive learning and greater discontentment among students and educators. In lectures, teachers typically out-talked the entire class of students; the bulk of the teacher-talking was to tell and instruct. Students come to develop a pattern of learning; wait for the teacher to ask questions, raise your hand, wait for the teacher to call you, share your response and wait for the teacher to tell you if your response is correct, appropriate or otherwise. Instructors took the easy way out by setting True or False questions and multiple choice questions, fit for graduate students to grade, and avoid asking questions in the examinations which stimulate and assess critical thinking and depth of understanding.

The fact is, HEIs operate in the trust market. Students trust the HEIs in doing the right thing and in awarding the marks or grades which they truly deserve[8]. At the same time, universities operate in a competitive environment. Branding and reputation matter to attract students. Universities pride themselves by achieving high graduate employment rates and good starting salaries for their graduates. When

6 Materials in this section are detailed in Sam (2021).

7Christopher Fynsk's The claim of language and Simon Wortham's Rethinking the university call for a rethinking of the university particularly in the humanities. Others like Kevin Carey (2015), Cathy Davidson (2017) and Bryan Caplan (2018) bring out the contemporary plight of the university and include analyses in a variety of contexts: globalization, onset of capitalism, growing commercialization of higher education and changing meanings of institutional practices and discourses.

8 Participants in the education market are involved in exchanges that are not frequent or repetitive. Once enrolled, the students are 'with the school' for many years, depending on the duration of the programme. Being a service industry, it is also difficult for the students and parents to know the true or genuine value of the transaction until the product is used, that is when the students are enrolled, and they begin to attend classes. The education providers know better than the students regarding the true learning experience and may not reveal all information, resulting in the students buying "lemons" – George Akerlof's (1970) terminology of a bad deal. As such, the higher education industry is highly regulated in most developed countries. This helps but regulations alone are unable to weed out incompetent agents and scandals involving HEIs.

the graduates are not employed, schools are blamed for ill-preparing the students and are undeservedly labelled as being of a lesser quality as compared to brand-named institutions. Hence, HEIs are in a hurry to secure employment for their graduates even before they graduate from the courses. Indeed, it is not uncommon for universities to make claims and promises.

Consider the following.

- Universities tell us that higher education appeals to students because it gets them to think about and deal with global challenges of today – poverty, climate change, global pandemic. Yet many universities still operate on a paradigm of compartmentalisation when we need a paradigm of diversity, relationships and multidisciplinarity.

- Often, students are trained to absorb a collection of facts to pass the exams. But they are of limited use the moment students walk out of the classroom and enter the labour force.

Trust and promise go together. When universities make promises they cannot keep and fulfil, people start to lose faith and trust in higher education. The result? Universities are at risk of losing their credentials[9].

Notably, more students are realising the reduction in the value of a degree (Levine & Pelt, 2021). The 2019 Gallup Poll reported 51% of the respondents in 2019 considered a college degree to be very important, down from 70% in 2013 (Marken, 2019). The APM Research Lab conducted a survey in 2018 to ascertain the value of a college degree in the United States. While 58% of the respondents believe that a four-year college degree is worth its price, the reasons given as to why a college degree is not worth it should be noted. 60% of the 36% of Americans who think a college degree is not worth the expense cited the lack of specific skills and a large amount of debt as the main reasons, while 36% feel that they can get a job without a college degree (Smith-Barrrow, 2019). The outbreak of the coronavirus has delayed any effort to improve the situation.

Today, many of the hiring companies still use education qualification and measurable smartness to assess a candidate's suitability in filling a job vacancy, particularly for earlier-career candidates. Education qualifications have become markers of excellence, exacerbating the desire for high marks and good grades. However, an increasing number of employers have announced that they will no longer require college degrees for employment, including Google, Penguin Random House, Hilton, Apple, Nordstrom, IBM, Bank of America, Ernst and Young's, Starbucks, Home Depot, Publix, Costco Wholesale, Lowe's and Chipotle (Glassdoor Team, 2020). There are high-profile professionals who have done remarkably well without a degree, pointing to the irrelevancy of a degree, including Michael Dell (founder of Dell Computers), Daniel Ek (co-founder of Spotify), Bill Gates (founder of Microsoft), David Karp (creator of Tumblr), Evan Williams (co-founder of Twitter), Mark Zuckerberg (founder of Facebook) and Steve Jobs and Steve Wozniak (co-founders of Apple).

Why is this happening? Students take part of the blame. We know that learning is a self-administered lifelong mission which requires innate drives, commitment and motivation. The irony is that some of the students are not willing to work hard for it. Learning for the sake of grades has replaced learning for the sake of learning. This is attributed to a host of factors, including the lack of time (only to be filled by activities that do not always contribute positively to learning), risk aversion (scared of failing and the inability to recover from one) and avoidance of half chances (tendency to stick to comfort by signing up for easy-to-pass and easy-to-score subjects).

The drive for commercial objectives is also partly responsible for the weakening of the credentials associated with a university education. Leading the pack are the diploma mills. In a typical diploma mill, there are no classrooms. Faculty members are often untrained, non-existent and unqualified. The authority to grant degrees does not come from a generally accepted independent entity. Public education institutions are driven by market forces as well. In the United States, federal research spending has stagnated while demand for financial capital have risen, compelling universities to pursue market efficiency and alternative sources of funding through academic-industry ties and student enrolment.

Focusing on student enrolment is not wrong. The problem arises when academic rigour is sacrificed. The allegation of falling academic standards is associated with rising grades. In the United States, the mean GPA for both private and public colleges in the 1930s was 2.3, or a C+. In 2015, the average GPA at public colleges was 3.0 or a B, whereas the average GPA at private colleges was 3.3 or B+ (Katsikas, 2015). While some have pointed to the rise of average IQ of each successive generation as the reason behind rising grades, others have pointed to commodification of education as the cause of it.

How do we know if academic standards have declined? Kevin Carey quoted a study from the US Department of Education on adult literacy and found that many graduates could not compare and contrast viewpoints of newspaper editorials. "Fourteen per cent of college graduates scored at only the basic level of literacy; good enough to read grade schoolbooks but not much more. The results showed a sharp decline from the same exams given a decade before" (Carey, 2015, p. 9). In another study, Richard Arum and Josipa Roksa (2010) collected a large sample of more than 2,300 students at four-year universities in the United States. The authors found that 45% of students did not show any significant improvement in critical thinking, complex reasoning, and writing skills during the first two years of college, and 36% of students did not demonstrate any significant improvement

9 The current system of education is designed for the mass production of students. Ken Robinson calls this the 'Industrial Education' system which serves to meet the demand of the industries for a 'tiered workforce', "students to do administrative and professional occupations, a large number to take up trade, and the majority for blue-collar jobs". The system is based largely on conformity, and the problem with conformity in education is that "people are not standardized in the first place" (Robinson & Robinson, 2022, pp. 57-58).

in learning over four years of college. Students who showed improvement tended to show only modest improvement. Nearly half would write just as badly in their junior years as when they started college. More recently, Jeffrey Denning and his colleagues (2021) documented the rising completion rates of college students in the United States over the last generation or so and rejected the explanation that the improved performance was a result of increased student quality. They see the phenomenon more as a result of the emergence of a student-as-a- consumer mentality and declining academic rigour and standards.

What can HEIs do about it? First, educational leaders need to reflect and think more deeply about moral issues. Why is it right to be truthful? What are the moral issues and challenges HEIs face right now that educational leaders ought to be thinking about? How are the courses delivered? How do HEIs treat the students? As customers or students? We need educational leaders who understand the need and have the capability to maintain and raise academic standard and rigor. Once this is in order, other reforms can be carried out.

Educational leaders may be aware of the danger of focusing on serving commercial interests and recognising commercially viable strategies and options as the only ones which merit actions. Other thoughts and ignorance of the consequences may have led them to mistakenly judge this as the right thing to do. They fail to use reason to explore options and reveal the inherent nature of the phenomenon in a holistic manner, downplaying academic rigour and standards in favour of profitability. External factors such as pressure from the shareholders can have considerable impact on decisions, especially for one whose internal mental capacity is not particularly strong. This could be a result of appointing an administrator with minimal academic and teaching experience to head the HEI. Accordingly, removing ignorance may require the appointment of a leader with extensive academic, teaching and managerial experience who would be in a better position to understand the very nature of the issues at stake[10].

Pursuance of profit is not wrong, even from an ethical point of view. But there is a need for some checks and balances to ensure that educational quality and rigour are not compromised. Profitability and academic integrity complement each other and keep each other in balance. The problem arises when administrators escape the intellectualism that forms the academic mindset. They lose contact with the academic demands. To them, more students are better. The academics, on the other hand, think that the administrators have not come down to the thinking level of students. They want smarter students who can grasp abstract theories and concepts the moment they step into the classroom. The facts are in. What students are experiencing is the reality, the personal experience of sitting in the classroom, trying their very best to make sense of the terminologies associated with the subjects. The picture painted is simplified but it proves to have its use. It is perfectly sound to reject the notion of 'the customer is king' in the education context when alternatives can be shown to generate superior practical outcomes. Alas, there are still many education institutions ignoring the practical aspect of the matter, seeking to pressure their academics to pass the students. Academics have stretched their minds to treat their students as students. Yet, we know that students deserve openness, quick responses to queries and full support in learning to get through the course.

Second, HEIs need to know that student centricity does not mean that the student, as a paying customer, is always right in every aspect. The idea of student centricity must align with the nature of service rendered in education. Riina Koris and colleagues have studied student-customer orientation and noted that students do not actually see themselves as customers on issues like curriculum design and classroom behaviour. However, students expect the education institution to treat them like customers in terms of communication and feedback. Student orientation needs to be informative and helpful (see Koris & Nokelainen, 2015; Koris et al., 2015). The implications on higher education institutions are twofold. First, the necessity to separate academic services and non-academic services and take a stand on what is the morally right thing to do. Second, universities should realise that students expect to be treated like customers in some areas, but not in all areas of educational experience. Schools trying to cater to their students' whims and wishes are doing more harm than good.

In dealing with ethical dilemmas, there is no such thing as a ready solution made in advance. We can refer to past experiences, case studies, theoretical underpinnings and consider the best practical experience that fit the collective needs and demands. We judge an idea to be acceptable because we can frame the idea to a favourable situation that is more valuable than other options. Whether we treat students as customers or students, colleges and universities must provide the necessary means fitted to facilitate the transformation of the students through the education process. The conditions must always be perfectly designed to ensure it.

Third, HEIs need to ensure that students are equipped with skills and knowledge that employers want. Although it is difficult to predict what the future may hold, one thing is clear; students must gain exposure to multiple perspectives and to develop the skill of creative problem solving to successfully navigate the increasingly complex and multidimensional nature of life and work in the twenty-first century. It is about problem-solving to a large extent, thinking about solutions to problems or even reframing the problems to move away from the mindset that there is one right answer. To become real intellectuals, Noam Chomsky called upon the teachers to help students discover the truth, "not through the imposition of an official truth" (Chomsky, 2004, p. 21). "It is the obligation of any teacher to help students discover the truth and not suppress information and insights that may be embarrassing to the wealthy and powerful people who create, design, and make policies about schools" (Chomsky,

10 Despite a number of scandals that have rocked the higher education sector, there are still many educational leaders who care about the students, who are dedicated to maintaining and raising academic rigour and standards and in ensuring that their students are equipped with skills and knowledge which employers want. They understand that good business is more than making money. There will always be single-minded ambitious executives who think about almost exclusively about the commercial aspect, but they are not the kind of leadership we want.

2004, p. 21).

HEIs must understand that companies will not hire students because of what they know. Google or perhaps other platforms are more knowledgeable than anyone of us. University education is not about teaching specific knowledge and skills for a specific job (like website tracking using Google or managing operations on Alibaba cloud). That is the role of the employers and professional associations. But universities can work with the employers and professional associations to offer short courses or incorporate subjects in partnership with the employers and professional associations into the courses that they offer.

The traditional way of learning where the educator stands in front of the class, delivering a lecture and trying to transfer his/her knowledge into the students' minds, is passive and not the best way of learning. A rapidly growing body of data indicates that emphasis on deep learning produces better students, for example in medical schools (see Guskey, 1980; Kulik et al., 1990; Martinez & Martinez, 1999). Deep learning is a subset of application-based learning, which requires students to interact actively with course materials through discussions, case studies and problem-solving. Application-based learning encourages active engagement and an appetite to explore and to know. Active engagement encourages the brain to ceaselessly generate and test hypotheses with motivation and curiosity. In "Literacy and intrinsic motivation", Mihaly Csikszentmihalyi argued that the chief obstacle to literacy is not cognitive, but the drive and motivation to learn. "It is not that students cannot learn, it is that they do not wish to" (Csikszentmihalyi, 1990, p. 115). The key to success is to get students to experience 'flow', and to do so, Csikszentmihalyi told us that students need to merge actions and awareness, that is, to step into the situation where the actor and actions become one. Students ought to feel that their skills are fully engaged by challenges. This is when "the student feels when he thinks he has found the solution to a difficult problem" – a good match between the student's ability and skills and the challenge posed by the problem (Csikszentmihalyi, 1990, p. 128).

Sports offers a useful analogy. Athletes participate actively without rigidly adhering to the instructions from the coaches. The thing that excites participants the most is the opportunity to apply what the coach has taught them and improve on it. Sports is fun, and athletes routinely receive feedback, praise, applause and recognition. That is why they always give their best in games. Therefore, participation in sports and games is so motivating. Striving to achieve higher performance and motivate students requires higher education institutions to consider a whole new approach to teaching and learning. A great teacher teaches his or her students how to use and improve upon the knowledge. With this in place, students will be willing to learn and do more. Forcing students to study is never going to make it and they will see no value in it. The traditional mass-production factory model is becoming less relevant and must be replaced with a student-focused approach.

Concluding remarks

The COVID-19 pandemic has highlighted weaknesses of conventional ways of teaching and learning that we did not see before. It offers us the opportunity to review what and how we teach our students. This paper highlights only two of the many of the considerations which HEIs have to work on. It points out that transitioning to any model of higher education in the post COVID-19 period needs careful consideration. For example, the desire for online education must be weighted with its limitations. One can argue that the onset of the pandemic only shows what great human teachers can achieve with the use of educational technologies. Human teachers matter to offer a more superior, differentiated, personalised outcome as compared to standard delivery via the Internet.

We also argue for continuing the efforts to strengthen the credentials of higher education qualifications. For one, universities need to know that student centricity does not mean that the customer is always right in every aspect. The basic premise is that a student-centric education institution should not focus on making academic studies easy for students. To complete a degree, students are expected to think, complete assignments, read widely, write extensively and prepare for examinations. Education entails dealing with difficult concepts and solving challenging problems. What is needed is a conducive learning environment and experience. This means setting up systems and processes in ensuring the safety of students and availability of learning support to enhance the student learning experience.

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The war in Ukraine as an opportunity to teach critical thinking

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Abstract

Although the war in Ukraine is the most extensively documented conflict ever, it is difficult to discern what is real, fictitious or from a state misinformation campaign. In the battle of spinning media narratives, the truth easily becomes a casualty. We explore the war in the context of various historical key events and reject a possible application of Baudrillard's perspective that 'there was no Gulf war' to the current conflict. We note the eerie resemblance of Russian media fabrications with the Nazis' big lie technique. The enormous toll of the war on Ukraine and the world is clearly stated. The war in Ukraine and the battle over the accuracy and legitimacy of history, knowledge and reality remind us of the crucial importance of teaching critical thinking. Critical thinking helps us see through manipulative and politically distortive usages of language to suit ideological purposes. In using the war in Ukraine as an opportunity to teach critical thinking, we can follow a generic model of gradual sequencing that prominently features modelling and scaffolding. In an era of weaponised lies and alternative facts, critical thinking has a central role in education, from kindergarten to university, with the purpose of education being the creation of an informed citizenry. Although critical thinking – and teaching critical thinking – are challenging, it is when both teachers and students realise their own responsibilities for creating a learning community that learning is at its most useful and critical thinking becomes empowering.

Introduction

Why should an opinion piece in a Journal of Applied Learning & Teaching concern itself with the war? There is more than one reason. Numerous articles in JALT have thematized a previous large crisis: the Covid-19 pandemic. In a recent editorial, we discussed that crisis as a *polycrisis*: a convergence of multiple intersecting, simultaneously-occurring crises that have taken the shapes of health, economic, environmental, social, political and educational crises (Rudolph et al., 2021). We have also argued before that "higher education does not exist in a vacuum" (Rudolph et al., 2021, p. 6).

When reflecting on Putin's 'special military operation' (the name for the war in Russia's synchronised media), we are reminded of Hitler's and Stalin's genocidal regimes. There is a German saying: "Wehret den Anfängen!" (literally: "fight the beginnings!"). This can be imperfectly translated as "nip things in the bud!", referring to dealing with the seeds of dangerous things. Obviously, we are way past the beginnings and much of the world – including our two home countries: Germany and Singapore – has woken up to the threat that Putin poses. It has condemned the illegal invasion of Ukraine and Russian war crimes.

A famous poem by German Lutheran pastor Martin Niemöller described the Nazis' incremental persecution of everybody who was different from them and the silence of Germans during the Third Reich, including that of the author:

> First they came for the socialists, and I did not speak out—Because I was not a socialist.
>
> Then they came for the trade unionists, and I did not speak out—Because I was not a trade unionist.
>
> Then they came for the Jews, and I did not speak out—Because I was not a Jew.
>
> Then they came for me—and there was no one left to speak for me.
>
> (Niemöller, cited in Martin Niemöller, 2012).

Citing Niemöller is not meant to claim any perfect parallel to what is currently happening in Ukraine and Russia and to what might occur at a later point. Other imperfect comparisons would be Nazi Germany's annexation of the Sudetenland in October 1938 and what happened to Czechoslovakia in March 1939; and the invasion of Poland on 1 September, 1939, and a subsequent false sense of security, with the war being dubbed a 'phoney' one, due to the relative military inaction in the eight subsequent months.

What these comparisons, however, allude to is that now is the time to speak out. They are a reminder that *all* education is inescapably normative and hence political. If further justification were required, it is the job of educators to pursue the elusive ideal of the truth and to combat fake news, disinformation and misinformation. Many universities' graduate outcomes specifically refer to the importance of critical thinking and critical reflection. So here is a gilt-edged opportunity to teach our students how to differentiate the garbage from fact-checked knowledge proper and to think critically about a key event.

Russia's psychedelic propaganda

After Russia's annexation of Crimea in 2014, Boris Nemstov, a former Vice Premier of Russia, commented: "Russia is quickly turning into a fascist state. We already have propaganda modeled on Nazi Germany's. We also have a nucleus of assault brigades, like the SA" (the *Sturmabteilung*, the Nazi party's paramilitary wing that helped Hitler rise to power: cited in Ostrovsky, 2017, p. 40). Hours after Nemstov said this in an interview, he was assassinated. In Western eyes, Russia's invasion of Ukraine on 24 February, 2022, evokes memories of Hitler's and Stalin's wars and atrocities and tempts us into a black-and-white, Manichean narrative of good (Ukraine) versus evil (Russia). Joe Biden has called Putin a "war criminal" and a "butcher", seemingly calling for regime change and accusing the Russian president of "genocide" (cited in Ghosh, 2022). In contrast, Volodymyr Zelensky, Ukraine's president and an erstwhile comedian (whose *Servant of the people* can be binge-watched on Netflix), has literally become a poster boy for democracy and the fight of David against Goliath. A reflection on Putin's previous military adventures renders the invasion of Ukraine less surprising. Putin led Russia during a war against Chechen separatists, oversaw Russia's victory in its war against Georgia and ordered a military intervention in Syria against rebel and jihadist groups. It was also under Putin that Russia annexed Crimea and sponsored a war in eastern Ukraine.

The war in Ukraine is the most extensively 'documented' ever, with enormous streams of data from disparate source materials being crafted into narratives that often are first available on social media before appearing on multiple news media platforms. We carry the war around with us in our pockets, uninterruptedly exposed to endless updates, alerts and alarms on our mobile phones. Even – or perhaps, ironically, especially – for viewers with uncensored access to a plethora of different media, it seems near-impossible to discern from all the amplified noise what is real, fictitious or from a state misinformation campaign. In the fog of war and in the battle of spinning media narratives, the truth easily becomes a casualty. It is the Russian media that have created a particularly fascinating spectacle.

Putin's reign has been characterised by a gradual shift toward totalitarianism, endemic corruption, the repression and incarceration of political opponents and the lack of free and fair elections (Gill, 2016; Reuter, 2017; Frye, 2021). The intimidation and suppression of independent media is an unsurprising part of this trend. Early in Putin's first presidency, he brought Russia's television networks under the control of the Kremlin. After more than two decades in power, the state also controls newspapers and radio stations, providing guidance on what to cover and how. After the beginning of the invasion, the last remaining independent Russian media have been shut down and many Western social networks such as Facebook, Twitter and Instagram have been banned

or blocked (*The Economist*, 2022d). The synchronized Russian media spin tales around the themes of Ukrainian Nazis, Western machinations and Russian heroism. Putin's claim of 'de-Nazification' is absurd but strategic. Zelensky is Jewish and whilst Ukraine is as imperfect as other Western countries are, it was, prior to the war, a vibrant democracy with a free, globalised economy. As opposed to Putin's Russia, it stood for freedom and hope.

It is true that during World War II, some prominent Ukrainian nationalists (some of whom were anti-Semitic) sided with the Nazis because they thought Hitler would grant Ukraine independence. Interestingly, in "Soviet post-war propaganda, Ukrainian nationalists were caricatured as the fascist enemy of the good Soviet citizen" (*The Economist*, 2022b). A contemporary search for Nazis would lead to Mariupol's Azov battalion, a paramilitary group in Ukraine's armed forces that uses SS (the Nazi elite corps, the *Schutzstaffel*) insignia (and that has, as a result, been characterised as 'neo-Nazi'). The conquering of Mariupol thus serves the Kremlin's narrative that it is 'de-Nazifying' the country (*The Economist*, 2020a). In Russia's manipulative propaganda, such an extremely thin empirical base is sufficient to spin tall tales that the "infamous" Azov "has left a trail of war crimes and civilian murders in its wake… British troops created and trained the group, fostering its Nazi ideology and adherence to neo-pagan cults" (*Izvestia*, May 11, 2022, cited in *The Economist*, 2022d).

In the Russian media, the war in Ukraine is framed as a re-enactment of the Great Patriotic War (1941-1945), with Ukrainians cast as Nazis, and in a cult of aggression, violence is hailed as proof of masculinity (*The Economist*, 2022c). The Russian defence ministry released a video in April 2022, featuring a commander of a battalion that carried out a *zachistka* (a 'mopping-up operation' during which soldiers go from house to house and murder civilians) around Kyiv:

> My great-grandfather went through the entire second world war and up to the year 1953 chased the fascist devils… through Ukrainian forests… I am a glorious successor of this tradition. Now my time has come and I will not disgrace my great-grandfather—and I will go all the way (cited in *The Economist*, 2022c).

Over the past two decades, Russian television has created a world where "nothing is true and everything is possible" (Peter Pomerantsev, cited in *The Economist*, 2022d). The effect of such propaganda has been described as "psychedelic" (*The Economist,* 2022d): one cannot trust anymore in anything one sees or hears. After an initial triumphalist reporting, anticipating a *blitzkrieg* – though calling the war a 'war' is a crime in Russia – the tone of the reporting has become increasingly hysterical. The 'special military operation' in Ukraine is but one front in a war with the West that is trying to destroy Russia. The Russian media construct some kind of parallel universe:

> Atrocities occur, but as a mirror of what Western audiences see. Civilians in Bucha, a town north of Kyiv, were not massacred by Russian forces who briefly occupied the area, but by Ukrainian soldiers. Western secret services arranged the bodies on the roads for journalists to find… Audiences are told that Russian troops have taken extra care to avoid civilian casualties, which is difficult because Ukrainian Nazis tend to hide in apartment blocks. Russian television uses this purported caution to explain why the operation is taking so long. If acknowledged at all, casualties are portrayed as heroes. The sinking of Russia's flagship Moskva cruiser on the Black Sea was explained as an accident unrelated to combat (*The Economist,* 2022d).

As early as 2014, Borenstein (2014) discerned three tropes in Russia's propaganda: (1) a long-delayed sequel to the Great Patriotic War (World War II); (2) atrocity propaganda – the Ukrainian enemy is not just fascist, but satanic ("Ukrainian fascists… crucified a three-year old boy in front of their mother"); and (3) the non-existence of Ukraine – with Putin having said repeatedly that "Ukraine [is] not even a real country" (cited in Borenstein, 2014). In order to try fathom why Putin would do something as seemingly crazy as to start a war in Europe, it is useful to understand his doctrine that all post-Soviet states are considered strategically vital and part of Russia's sphere of influence (Tsygankov, 2015). A series of colour revolutions in some post-Soviet states in quick succession – the Rose Revolution in Georgia in 2003, the Orange Revolution in Ukraine in 2004, and the Tulip Revolution in Kyrgyztan in 2005 – led to frictions in the relations with Russia.

During 2004's Orange Revolution, huge demonstrations overturned the result of an election rigged in favour of Putin's candidate, Viktor Yanukovych. After the Maidan unseated his kleptocratic ally Yanukovych once again in 2014, Putin invaded Crimea. Putin has described Ukraine as "Little Russia" and "not even a state" that was created on a whim by the Bolsheviks (cited in Düben, 2020). After the February 2014 Revolution of Dignity that ousted President Yanukovych and made him flee to Russia, Putin described the people that came to power as "nationalists, neo-Nazis, Russophobes and anti-Semites" (cited in Dreyfuss, 2014). In Putin's version of history, Russians and Ukrainians "are one people. Kiev is the mother of Russian cities. Ancient Rus' is our common source and we cannot live without each other" (cited in Düben, 2020). The Kievan Rus' was a medieval state that united most of the East Slavic tribes and that adopted Byzantine Orthodoxy in the ninth to 11th centuries.

There is an unholy alliance between church and Putin. Patriarch Kirill, the head of the Russian Orthodox Church, described Putin's presidency as a "miracle of God" (cited in *The Economist,* 2022f). When it comes to the invasion of Ukraine, the church leader is implicitly supportive, denying that Russia is the aggressor and claiming that genocide is being perpetrated by Ukrainians against Russian speakers in the Donbas (*The Economist*, 2022f). Patriarch Kirill claims that Russians and Ukrainians come "from one Kievan baptismal

font" and share "a common historical fate" (cited in *The Economist*, 2022f), thus supporting Putin's mendacious narrative that Russia is liberating its neighbour.

The Russian Empire considered Ukrainians to be ethnically Russian, referring to them as "Little Russians" (Abdelai, 2005), who were in need of russification (Bassin et al. (Eds.), 2015). For instance, in 1804, the Ukrainian language was banned from schools, and in 1876, most Ukrainian language books were prohibited (Steele, 1988). Then, in 1932-1933, something incredibly nefarious and horrible occurred: Stalin inflicted a famine on Ukraine that killed around four million people (Applebaum, 2017). Applebaum (2017) argues that starvation was used as a deliberate attempt to suppress Ukrainian nationalism during the *Holodomor* ('extermination by hunger'). By confiscating the last grain from hungry peasants and then blocking them from leaving their farmlands, Stalin waged war on Ukraine by means of starvation with the aim to Sovietize Ukraine (Applebaum, 2017).

Are there echoes of Stalin's *Holodomor* in Putin's war? Whilst Putin described communism in 1999 as "a blind alley, far away from the mainstream of civilization" (cited in Matlock, 2020), he also described the fall of the Soviet Union as "the greatest geopolitical catastrophe of the 20th century" that has left Russia pillaged and shamed (Putin, 2005, cited in *The Economist,* 2022e). It is increasingly obvious that his project of a Great Russia seeks to not only become the heir to the Soviet Union, but also to the Tsars. An interesting biographical snippet that Putin's grandfather was a personal cook to both Lenin and Stalin (Putin says, 2018) speaks volumes. To claim present-day eastern or southern Ukraine as part of 'the historical South of Russia' or 'primordially Russian territories' seems preposterous, as "there was no substantial Russian presence in these territories at any time prior to the 19th century" (Düben, 2020). Equally false is Putin's revisionist assertion that Ukraine's south-eastern borders were established 'with no consideration for the ethnic make-up of the population'. In 1926, ethnic Ukrainians still far outnumbered ethnic Russians in all territories of eastern Ukraine. Only the *Holodomor*, Stalin's genocide, changed that (Düben, 2020).

Against Baudrillard's anti-epistemology or 'the war in Ukraine is not taking place'

The Russian media and public are not allowed to use the word 'war'. Putin threatens journalists with up to 15 years in jail if they do not parrot official falsehoods, thus re-Stalinising Russian media. From that distorted and psychedelic perspective, there is no war in Ukraine. If French philosopher Jean Baudrillard were still alive, he would probably echo that sentiment (that a war in Ukraine is not taking place), albeit for different reasons. Infamously, Baudrillard (1995) had declared in 1991, that there was no Gulf War. Of course, this is an outrageous statement: direct casualties as a result of the first Gulf War are officially estimated at 100,000, not factoring in subsequent loss of life due to disease and starvation (Patton, 1995). However, Baudrillard was neither a raving lunatic nor a conspiracy theorist. Through his controversial writings, he raised serious questions about reality, truth and history.

According to Baudrillard, what we perceive as reality is in fact hyperreality. Hyperreality consists of both the 'unreal' – or the virtual that Baudrillard also calls simulacra – and the 'real'. Whether voluntarily or subconsciously, illusion and reality become entangled in our perception that is often based on our preferred interpretation of events. The Gulf War was a heavily televised war, television entertainment that was produced akin to reality TV (Gilman-Opalsky, 2011). For the first time, a global audience was able to view images from a war that were relayed 'live' from the battlefront (Patton, 1995). In another first, it was possible to watch the footage of the trajectories of real missiles hitting their targets, due to cameras assimilated into the military devices (Gilman-Opalsky, 2011). Due to a new level of control over the images and the reportage by the U.S. military, it became possible to portray the war as 'clean', focusing on the superior U.S. weaponry and with relatively few images of human casualties – none from the Allied forces (Patton, 1995). In Baudrillard's (1995) view, the Gulf War was a CNN spectacle in which commentary and propaganda were disguised as information and facts. The media coverage of the Gulf War was akin to a Hollywood blockbuster that was released simultaneously and worlwide: "every screen was treated to the same images of the same smart bomb" (Borenstein, 2014).

It could thus indeed be said that the Gulf War, as we viewed it on television and as we claimed to know it, did not take place (Gilman-Opalsky, 2011). Nonetheless, Baudrillard's perspective is deeply troubling and problematic. While Baudrillard does not deny the existence of reality, he regards himself as a 'reality agnostic' which means that reality is essentially unknowable and that every event is a potential simulacrum. As truth is a claim that relies on reality, this also makes Baudrillard 'truth agnostic' and a 'history atheist' (Gilman-Opalsky, 2011). As knowledge becomes unknowable and no event can be treated as 'real', Baudrillard's position is anti-epistemological.

While Baudrillard makes some intriguing points about hyperreality and simulacra, it would be a big mistake to follow him all the way in adopting his reality-agnostic and anti-epistemological stance. Such a position would make us doubt everything and play into the hands of master-manipulators like Putin. The German philosopher Ludwig Wittgenstein's writings on certainty (1970) may provide a cure for Baudrillardian scepticism. The radical sceptic who wants to doubt everything misses the point that our doubt is only meaningful within a system of certainties. Moreover, in order to doubt something, reasons are required – this renders a radical, all-encompassing Cartesian doubt impossible and nonsensical. For instance, doubting the existence of something in the outside world is only meaningful if we are not doubting the meaning of our own words. Wittgenstein's (1970) approach can be regarded as somewhat therapeutic in showing the 'unreasonable', unnecessary and in the end, impossible nature of a skepticism that questions everything. Another perspective on questioning whether the Gulf War was indeed a 'war' is provided by American linguist and social critic Noam Chomsky. In Chomsky's view, war in the sense that it "involves two sides in combat, say, shooting at

each other… did not happen in the Gulf" (Chomsky, 1992, p. 51). Instead, both sides were involved in state terrorism (Chomsky, 1992). Chomsky's perspective on the Gulf War not having been a 'war' is comparable to the Estonian Prime Minister's interpretation that instead of a battlefield, Ukraine is a "crime scene", with there being "more civilian victims than… military casualties", Russia engineering "humanitarian catastrophes in cities such as Mariupol" and "[t]argeting civilians" which is a war crime (Kallas, 2022).

Putin's big lie

Putin's fabrications – around his 'special military operation' de-Nazifying Ukraine – are nothing but the latest big lie. The concept of the big lie occurs in Hitler's *Mein Kampf* (1939). It describes the use of a lie so colossal that no one would believe that someone could have the impudence to distort the truth so infamously. Constant repetition in different media is important for the success of the big lie technique. Hitler falsely claimed that such a propaganda technique had been used by Jews to blame Germany's loss in World War I on General Ludendorff. This is related to the *Dolchstoßlegende* (stab-in-the-back myth), the revisionist claim that Germany was not defeated in war in 1918, but betrayed by internal groups. The actual big lie was the one by the Nazis themselves: that Germany was an innocent, besieged land striking back at "international Jewry" (that supposedly had begun a war of extermination against Germany) – consequently, Germany, according to the Nazis' big lie, had a right to annihilate the Jews in 'self-defence' (Herf, 2006). Aided by this big lie that was tirelessly propagated by Joseph Goebbels (the Reich Minister of Propaganda), Nazis thus managed to turn long-standing antisemitism in Germany into the Holocaust. (The concept of the big lie re-emerged in the 21st century when Donald Trump falsely claimed that the presidential election of 2020 was stolen through massive electoral fraud, leading to Trump supporters attacking the U.S. Capitol – and Joe Biden labelled that a "big lie" (Block, 2021).)

It is doubtful that Joseph Goebbels' oft-quoted characterisation of the big lie is actually attributable to him (Bytwerk, 2008):

> If you tell a lie big enough and keep repeating it, people will eventually come to believe it. The lie can be maintained only for such time as the State can shield the people from the political, economic and/or military consequences of the lie. It thus becomes vitally important for the State to use all of its powers to repress dissent, for the truth is the mortal enemy of the lie, and thus by extension, the truth is the greatest enemy of the State.

Although Goebbels may have never said this, it would have described the Nazis' big lie strategy quite perfectly. Putin's own big lie is eerily reminiscent of the Nazis. Andrew Wilson (2022) characterised the Russian invasion as "the War of the Big Lie":

> "The Lie that Ukraine doesn't exist. The Lie that Ukraine has no right to full sovereignty because it is a puppet state of the West. The Lie that A invaded B because C is to blame—the West, the expansion of NATO, the USA's global hegemony".

Jailed Russian opposition politician Alexei Navalny has said that the "monstrosity of lies" in the Russian state media "is unimaginable" -- and "unfortunately, so is its persuasiveness for those who have no access to alternative information" (cited in Day, 2022).

The catastrophic spectre of the war

Ukrainians have a long history of suffering and oppression:

> Ukrainians have been oppressed by the Habsburgs, the Russian Empire, the Poles, the Nazis and the Soviet Union. Even Czechoslovakia once snaffled a slice of western Ukraine. Ukrainian oligarchs have acted like another set of exploitative colonisers since independence in 1991. In the 20th century alone, some 14m people are believed to have been killed in Ukraine through purges, famine and the Holocaust (*The Economist*, 2022b).

The current war is taking an enormous toll on Ukraine, with millions of people internally displaced, millions of especially women and children having fled the country, thousands killed, destroyed infrastructure and levelled cities. The Russian army is using terror, torture, rape and mass murder as routine tools of war (*The Economist*, 2022g). Russian soldiers and their commanders are guilty of many crimes, though they may never be tried for them. Russia's invasion itself is a crime of aggression, as spelled out in the statutes of the International Criminal Court (ICC). Russian war crimes include summary executions at Bucha and the bombing of the Mariupol theatre – the city's largest air-raid shelter that had the Russian word for children written in letters large enough to be seen from the sky. Russia's indiscriminate shelling of Ukrainian cities fulfils the ICC's definition of crimes against humanity: "a widespread or systematic attack directed against civilians" (cited in *The Economist*, 2022h).

At the point of writing, NATO and the EU appear unusually united in a consensus that Putin's empire-building must be stopped in Ukraine. Not only Putin's own history, but also the ones of dictators like Hitler and Stalin, show that if Russia is allowed to prevail in Ukraine, there likely will be further 'special military operations' in other European countries. A democratic and free Ukraine is an existential threat to Putin, as it offers an alternative to his dictatorial regime. In the meantime, the war in Ukraine has unintended catastrophic consequences. As a result of limited Russian and Ukrainian food exports, there is the "spectre of a global food shortage" that could last for years, according to UN Secretary General António Guterres (cited in *The Economist*, 2022i):

> The high cost of staple foods has already raised the number of people who cannot be sure of getting enough to eat by 440m, to 1.6bn. Nearly 250m are on the brink of famine. If, as is likely, the war drags on and supplies from Russia and Ukraine are limited, hundreds of millions more people could fall into poverty. Political unrest will spread, children will be stunted and people will starve.

Conclusion: the war as an opportunity to teach critical thinking

The preceding text shows that with the war in Ukraine, we are also in the heart of a political battle over the accuracy and legitimacy of history, knowledge and reality. With many millions of people's lives at stake, directly and indirectly, this is not an abstract issue. Getting our students to think critically is high on the agenda of many good teachers. But what does critical thinking actually mean? According to Stephen Brookfield (2012, p. 1), the basic process of critical thinking "entails (1) identifying the assumptions that frame our thinking and determine our actions, (2) checking out the degree to which these assumptions are accurate and valid, (3) looking at our ideas and decisions (intellectual, organizational, and personal) from several different perspectives, and (4) on the basis of all this, taking informed actions".

Brookfield (2012) has identified five distinct intellectual traditions that shape the understanding of critical thinking: (1) analytic philosophy and logic, (2) the hypothetico-deductive method of the natural sciences, (3) pragmatism, (4) psychoanalysis and psychotherapy, and (5) critical theory. Consequently, if we do not clarify our use of the term critical thinking, we invite miscommunication, as everybody is rooted in their own disciplinary orientations. However, the five paradigms of critical thinking are not mutually exclusive and despite some possible contradictions between them, we can use all of them. For instance, language tricks – such as repeating a distorted argument often enough so that it becomes fact – feature prominently in analytic philosophy, but such manipulative and politically distortive use of language to suit ideological purposes also interests critical theorists. The American tradition of pragmatism (associated with philosophers like Dewey and Peirce and not to be mixed up with opportunism) perhaps best describes what many teachers do: it is an experimental pursuit of student- and learning-centric outcomes. Being constantly exposed to new perspectives and considering them seriously keeps us open to surprises and makes us question our assumptions (Brookfield, 2012). Once we stop learning and thinking critically, we are in a downward spiral. Hence, we as teachers are ideally forever becoming.

Whilst critical theory presupposes relatively rigidly that our world is organised to keep dominant elites in power and stupefy the rest of us by getting us to accept dominant power as natural, obvious and common-sensical, it also has a self-critical strain (Brookfield, 2005). A simultaneously pragmatic orientation is further helpful as it allows for our axiomatic assumptions to be proved wrong. For example, after the fall of the Berlin wall and the end of the Soviet Union more than 30 years ago, it was a common assumption that war in Europe would no longer be possible. This paradigmatic assumption has been proved to be false.

Brookfield (2012) helpfully differentiates three categories of assumptions: causal, prescriptive and paradigmatic. Causal assumptions are common and easy to identify: if we do this, then that will happen. However, causal assumptions such as 'as long as we engage Putin, he will not attack Ukraine' can be problematic, as recent events have shown. Prescriptive assumptions follow the logic of 'we are doing it this way because we know this is the way it should be done.' They refer to our regime of truth (Foucault's (1980; 2000) term for our types of discourse that describe what counts as legitimate processes in the construction and production of knowledge and truth). The most deeply buried assumptions are paradigmatic, as they frame our worldview. These lead us to decisions that seem so obvious that we may misconstrue them as 'reality' and the way the world is ordered. For instance, Goebbels had paradigmatic assumptions about supposed 'Jewish impurity' that led him to justify his extreme anti-Semitism and the Holocaust (Brookfield, 2012). Questioning our paradigmatic assumptions complicates our world and could even lead to its collapse. Hence, applying critical thinking to our paradigmatic assumptions may be the most testing intellectual ordeal.

How can we use the example of the war in Ukraine as an opportunity to teach critical thinking? We can follow a generic model of teaching critical thinking that guides our students through various stages and does not throw them into the deep end of the pool. It is important to note that learning to think critically takes time. A first step is to model critical thinking and for instance, to share how surprised the teacher was at the beginning of the war and how it has played out so far. For instance, one paradigmatic assumption was that war in Europe would no longer take place, another that Putin would win the war very quickly in the fashion of a *blitzkrieg*. While modeling critical thinking, it is good to show our participants that we as teachers can err in our paradigmatic assumptions and have to be open to change them. Demonstrating that critical thinking may well lead to better decisions and more informed actions also seems like a good idea. As critical thinking is a social learning process, it can be practiced well in structured discussion groups. Teaching and learning to think critically also requires much scaffolding. It is good to start in a fairly simple and non-threatening way and only very gradually take people closer to a direct analysis of their own thinking patterns and assumptions. Going too fast too soon is a recipe for disaster (Brookfield, 1987, 2012).

Can nefarious leaders be considered critical thinkers? Goebbels was a master of ideological manipulation and due to his aforementioned paradigmatic assumptions, presumably thought of repeating the big lie ad nauseam as a legitimate strategy of using propaganda. If we restrict our concept of critical thinking to mental processes, his and fellow Nazi leaders' evil though strategic thinking makes them critical thinkers. Putin may have grossly overestimated the ease with which the war could be won, but when viewed from his perspective to restore the 'greatness' of Russia along the lines of tsars such as Peter the Great (Rainsford, 2022),

his thinking is certainly strategic and contains components of critical thought. However, Goebbels's or Putin's thinking would not qualify as 'critical' if viewed from a critical theory or pragmatist perspective. Critical thinking must also be viewed in context and cannot be evaluated separately from moral or political values (Brookfield, 2012).

How can teaching critical thinking help combat big and small lies? In an era of weaponised lies, fake news, 'counterknowledge', half-truths, 'alt truth' and conspiracy theories, truth matters (Levitkin, 2017). Critical thinkers question information and perspectives and seek to think beneath the surface in their reading. Critical thinking requires discernment. We need to be careful what sources we use, evaluate their credibility and ideally triangulate them with other trustworthy sources. The death of many newspapers and the fact that many people receive their news via social media is problematic in this context.

Bell hooks (2010) has argued that children in school are usually discouraged to think as it is 'dangerous' and it is better to be obedient. This discouragement of critical, independent thinking continues in traditional higher education (hooks, 2010). However, critical thinking has a central role in education. The purpose of education, from kindergarten to university, is often framed to be the creation of an informed citizenry. In our complex world, critical thinking may well be the most pressing educational, societal and political need. Accordingly, it is quite obvious that critical thinking should be a mandatory topic taught from kindergarten onwards.

In order to maintain the integrity of the critical thinking process, teaching critical thinking requires a radical openness from teachers who must be ready to acknowledge that they do not know everything and that the shape of knowledge is constantly changing (hooks, 2010; Brookfield et al., 2019). Critical thinking involves a reflective dimension and self-criticism is a necessary element of it. Critical thinking places demands on both teachers and students and requires the latter to be engaged. It can be discouraging when students resist critical thinking, yet when at least some students learn it, it can be very rewarding for both students and teachers. Ideally, when both teachers and students realise their own responsibilities for creating a learning community, learning is at its most useful and critical thinking becomes empowering (Brookfield et al., 2022).

This opinion piece may have raised more questions than it has answered. This is very much within the practice of critical thinking. Rather than commodifying knowledge within a neatly bounded package of facts, it may be better to end with questions such as the following (see Brookfield, 2012) that may also be applied to our text: What are the assumptions the authors operate under? Are they accurate and valid? Are alternative interpretations omitted? Are there inconsistencies in the text? What are the strongest arguments and why? Are parts of their arguments confusing? Are claims empirically grounded? Do authors' personal preferences masquerade as objective facts? Are there significant unacknowledged biases?

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Should have been an email? Meeting redesign for applied educators

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Abstract

Due to the logistic and interpersonal demands of applied teaching, applied educators often simultaneously have more to meet about and less time available for meetings. This can contribute to time poverty and overwhelm in a cycle that erodes productivity over time. While meetings are often necessary, they are frequently inefficient, ineffective, and demoralizing. This paper reviews relevant studies on effective meeting redesign, recommends specific strategies for applied academics, and describes an example of implementation in an applied learning setting.

Keywords: Efficiency, meeting redesign, time affluence.

Should have been an email? Meeting redesign for applied educators

Time, and the sense of having enough of it, is essential for professional productivity and personal well-being (Kasser & Sheldon, 2009; Mullainathan, 2014). One promising strategy for increasing time affluence is *meeting redesign*. This paper reviews relevant studies on effective meeting redesign, recommends specific strategies for applied academics, and describes an example of implementation in an applied learning setting.

Time affluence in applied education

Time poverty, or the sense of not having enough time, is associated with overwhelming cognitive load and "existential overload" caused by multitasking, incomplete projects, perceived stress, and disproportionate time spent on unenjoyable tasks (Benson & Barry, 2011; Kasser & Sheldon, 2009). Ultimately, a prolonged state of time poverty is counterproductive, leading to objectively poorer performance in addition to subjective malaise. In contrast, *time affluence*, or the sense of having enough time for essential tasks with some time left over, is associated with productivity, physical health, community engagement, subjective wellbeing, and happiness (Kasser & Sheldon, 2009; Markovitz, 2011; Mullainathan, 2014).

Like many professions, academia in general is struggling with time poverty, and applied educators in particular are uniquely impoverished by the pragmatic, gatekeeping, assessment, and risk management demands of implementing learning experiences outside of the standard classroom setting (Waters, 2020).

In an effort to cultivate time affluence, forward-thinking business leaders are experimenting with shorter workweeks. While some organizations are simply condensing the workweek by cramming the same hours of work into four long days, others are generating true time affluence by shortening the actual number of hours spent on work. In a study of companies that successfully shortened the workweek while maintaining salaries and revenue, Pang (2020) identified three key strategies for increasing time affluence. The first was to use design thinking to *reduce the amount of time spent in meetings*. This approach is especially relevant to applied education and is the focus of the current paper. Due to the unique demands of logistic coordination, authentic assessment, and community interfacing, applied educators simultaneously have less time available for meetings and more to meet about (Waters, 2020). Meeting redesign has the potential to make a substantial impact on our time affluence.

Why meetings matter

For the purposes of this paper, the most important thing about meetings is that they often aren't important enough. People commonly complain about meetings being too numerous, too long, and not useful (Garcia et al., 2003). The hours lost to superfluous meetings is a critical cost in time-impoverished organizations, but perhaps equally problematic is the "bitter aftertaste of time wasted," which contributes to low morale (Garcia et al., 2003, p. 46). Participation problems range from sluggish under-engagement to power-seeking pedantry (Garcia et al., 2003). Either way, meetings so very, very often take much, much longer than planned (Haase & Miedl, 2007). Finally, the often-frustrating process of scheduling and keeping track of meetings results in endless,

thankless administrivia.

Poorly run meetings waste time and cause "meeting fatigue" (Shore, 2013), but while corporate managers often have some training in meeting design, academics frequently do not (Fetzer, 2009). In fact, sometimes our more impressive talents – such as expansive erudition, deep musings, and meticulous cogitation – are comically counterproductive within the context of a meeting.

Meeting redesign

The goal of meeting redesign is simply to reduce the amount of time wasted on low value or no-value tasks, so that more time can be spent on high value tasks (Andersson & Au-Yeung, 2015). Even before the Coronavirus pandemic, remote work and flex-time models were increasing in popularity, partly as an effort to increase time affluence. Now more than ever many people recognize the ecological, organizational, and personal benefits of flexible remote and hybrid approaches (Pang, 2020), but these models often result in less available synchronous time. And while the pandemic has accelerated the adoption of new technologies, the *intelligent* application of these tools still needs some work (González & Mark, 2004; Siemens et al., 2020). For example, studies on "Zoom fatigue" suggest that remote meetings are uniquely exhausting (Shoshan & Wehrt, 2021). Anecdotally, remote technologies accentuate inefficient meeting practices; when friends send irreverent pictures of themselves doing yoga during a meeting, it draws attention to the fact that some meetings were *never* worth one's full attention, even before technology allowed people to "participate" with their cameras off. While high-quality meetings are fulfilling and energizing, reducing the amount of time spent in ineffective meetings is more important than ever.

Meeting redesign can improve overall performance in several ways. The most obvious is that time not spent in meetings or on meeting-related administrivia can be applied to more valuable tasks. Additionally, meeting redesign helps to de-fragment the day by reducing the number of interruptions to the flow of meaningful work, thus increasing efficiency and quality (Newport, 2021). Finally, actively signaling to colleagues that you respect their time promotes affinity, collegiality, and energetic bandwidth (Burghardt & Tolliver, 2010; Mullainathan, 2014).

Deciding whether to meet

Only hold a meeting if there is a definite purpose (Haase & Miedl, 2007; Pang, 2020; Shore, 2013). Ideally, the purpose(s) of a meeting will be clearly articulated on a pre-circulated agenda, and the agenda itself should be zealously managed so that only items that require real-time synchronous collaboration are included (Garcia et al., 2003; Pang, 2020). Items that require group decision-making, brainstorming, and problem-solving are great content to include in a meeting. In contrast, due dates, calendar events, awareness raising, and "for your information" (FYI) items do not require synchronous engagement and should be handled through other conduits (Garcia et al., 2003). Some strategies for organizing asynchronous communication are offered later in this paper.

Deciding when to meet

The timing of meetings requires deliberate balance. On one hand, meetings should be held only when needed. On the other hand, an ad hoc approach generates scheduling complications and encourages people to fragment one-another's workflow with "quick" questions (Newport, 2021). If people need to collaborate on decisions regularly, then regularly scheduled meetings are useful, but the team should cancel freely rather than holding a meeting just because it's scheduled. Effective strategies also include scheduling meetings for purposefully shorter intervals to motivate good time management (Pang, 2020), and using natural boundaries, such as choosing a time when several people have to go to class right after the meeting.

Deciding how to meet

Once a meaningful agenda has been set, the key to effective meetings is active structured moderation (Haase & Miedl, 2007). Simple strategies include assigning time limits to agenda items (Haase & Miedl, 2007), and using technology to track progress and maintain focus (Fetzer, 2009; Pang, 2020). A conceptual "parking lot" can serve as a holding tank for any tangential issues that threaten to derail the agenda (Haase & Miedl, 2007), making it easier to both keep track of these items in the future and let go of them in the present.

A more substantive modification is to adapt the "flipped classroom" model to the meeting process, by pre-circulating all background data, drafts, policies, etc. (Pang, 2020). This strategy frees up more synchronous time for collaborative processes, and also gives participants the opportunity to think things through before articulating their thoughts, thus resulting in higher quality contributions. However, it is imperative that the background information is not reviewed at the meeting itself, else time will be doubly-wasted and people won't bother preparing for future meetings. This approach might initially be uncomfortable in that it sets new norms of collegial responsibility, which may require some adjustment.

Deciding with whom to meet

Andersson and Au-Yeung (2015), suggest that sloppy invitation practices are one of the biggest threats to effective meetings. Obviously, excluding essential participants will delay progress. But including people who don't need to be there can also create serious problems (Garcia et al., 2003; Pang, 2020). At best, non-essential participants will be wasting their own time simmering resentfully in a meeting that doesn't apply to them. Even more costly is when they waste the entire team's time by actively participating despite their lack of relevance, thus derailing and complicating the workflow with underinformed contributions (Newport, 2021).

Reducing the number of nonessential participants in a meeting requires assertive management of both agendas and *invitation lists*. For ad hoc meetings, the invitation list must be curated to include only essential participants. For standing group meetings (e.g. department, board, team, etc.), the agenda must be tightly controlled. Nothing is allowed on the agenda that is not directly relevant to *every* member of the group.

Should have been an email?

Many meetings devote substantial time to "FYI" items that need to be shared, but don't require discussion. As indicated above, this is a poor use of synchronous time, but it is still an essential administrative function. FYIs need to be managed intelligently with a clear, organized process.

The sentiment "*that meeting should've been an email*" is common enough to have achieved meme status, but email is probably not the best conduit for conveying FYIs. Most organizations are already suffering from e-mail overload (Newport, 2021) and tech-driven "constant, constant multi-tasking craziness" (González & Mark, 2004, p. 24). Meeting re-design should fix inefficacy, not outsource it. A simple alternative is to gather FYIs into a single source that can be distributed on the same schedule that meetings are typically held. This avoids constant minor disruptions to workflow, and allows individuals to efficiently batch-process FYIs after outfitting themselves with the proper tools, such as calendar, task-lists, project boards, and the gritty mindset necessary to tackle the dull minutiae of administrivia.

Applied example of meeting redesign

My interest in meeting redesign developed out of desperation. I was a faculty member on a team with an applied learning mission, which I loved. But our team was overwhelmed by the challenges that often accompany applied education. In particular, we were exhausted by long, frequent meetings that were inherently demoralizing because they diverted so much time away from productive work. So, I decided to experiment with meeting redesign. By the end of one academic year, total meeting time was reduced by a couple hours per person per month. The key strategies included the following:

- The final agenda would be distributed one week before the meeting date. In addition to the standard list of topics, we included:

  A separate section of FYI items that were gathered for convenient batch-processing, but absolutely not reviewed during synchronous meeting time.

  Another section of Flipped Content, which was any background information relevant to discussion items on the agenda (e.g. data, policies, drafts, proposals). Just like in a Flipped Classroom, team members were expected to review this content prior to the meeting. During synchronous meeting time, discussion would commence with the assumption that all Flipped Content had been already been reviewed by each member. This took some getting used to, but worked really well after just a few awkward meetings. Ultimately, discussion was elevated by the fact that team members had spent some time seriously considering issues in advance.

- When submitting an agenda item, members were asked to estimate a time-limit. If the time-limit was reached during the meeting, then we would typically assign an individual or small group to workshop the issue before the next meeting.

- A "follow-up" section was added to the agenda where we would delineate any action items, who was responsible, and a deadline for completion. This section was especially useful for tangential topics that threatened to divert the team from the agenda.

Andersson & Au-Yeung (2015) suggest that a standardized agenda solves many problems and in fact our agenda template ultimately served as the core organizing structure for our meetings. This template, in condensed form, is shared as an example that could be adjusted to different contexts.

Table 1: Sample agenda template.

Sample Agenda Template		
Discussion Items	**People Responsible**	**Estimated Time**
(Includes synchronous discussion items only)		
Follow Up	**People Responsible**	**Follow-Up Date**
(List all action items identified during meeting)		
FYI Items (List items that do not require synchronous collaboration; do **not** review during meeting)		
Flipped Content (Information that that participants must review before meeting; do **not** review during meeting)		

Lessons learned the hard way

Meeting redesign takes time and effort. It is not recommended for organizations that are already time-affluent. At best, redesigning a meeting that is already good enough will yield diminishing returns. At worst, group members may be frustrated by unnecessary efforts to micromanage a process that is already working (Andersson & Au-Yeung, 2015).

Manage initial costs proactively. In the first few months of redesign you may spend more time preparing for the meeting than actually meeting. If possible, find a way to offset these costs rather than just piling them on (Waters & Frank, 2016). For example, if the current meetings are unwieldy and unproductive, is it possible to simply cancel one and devote that time to the redesign process?

While meeting redesign results in more time affluence for the team, the process of organizing these meetings may be labor-intensive for the team leader even after the initial development period. However, the overall cost-benefit balance still may work in the leader's favor. If

meeting redesign results in more affluence for the team as whole, do the improvements in productivity and morale ultimately serve the team leader as well? Are the meetings more constructive, engaging, and uplifting in tone (Haase & Miedl, 2007)? Does running effective meetings help the team become productive enough for the leader to delegate a task to off-set the time required to run good meetings? Ultimately, we live and work in systems, and the wellbeing of the team can have an enormous impact on the individual leader (Siemens et al., 2020). By cultivating time affluence for the entire team, meeting redesign can have an enormous impact on applied educators, our students, and the communities we work with.

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A quasi-experimental evaluation of a flipped class in a public health course

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Abstract

Objective: Evaluate the role of flipped class in an undergraduate epidemiology course.

Methods: A pre-post quasi-experiment with historical controls was conducted to evaluate students' attitude, perception, and self-efficacy of epidemiology through a flipped class approach.

Results: The sample included 254 undergraduate students. Students' attitude, perception, and the usefulness of epidemiology, along with self-efficacy in problem solving, significantly changed after end of class. The average grade rose from B to A-. Qualitative feedback captured two themes: increased pace of the course and collaborative learning.

Conclusion: To encourage collaborative learning, this study encourages the integration of active learning together with the traditional lecture style.

Keywords: Efficacy; epidemiology; flipped classroom; pedagogy; USA.

Introduction

Higher education is undergoing a paradigm shift where the 'sage on the stage' approach is giving way to high-impact practices that actively involve students in the learning process (King, 1993). Moreover, as millennials respond faster to the evolving technologies, research shows a decreasing tolerance for the lecture-style dissemination of course materials (Roehl et al., 2013). Lecture-based teaching also constructs a barrier due to limited time for in-class activities that allow students to effectively practice the applicability of learned theories. As a result, such traditional modes of teaching promote passive learning, where students hear the theoretical foundations, but do little to enhance skill-building (Lowe, 2011).

Literature review

To alleviate the barriers of such a pedagogical approach, Garrison (Garrison & Kanuka, 2004) argued the use of blended learning in higher education, which integrates both face-to-face and online components, to complement and effectively improve critical thinking among students, while Meyer (Meyer 2003) noted the feasibility of higher order thinking through online discussion forums. Similarly, one of the latest trending classrooms learning techniques of the 21st century is the utilization of a flipped classroom method, whereby technology is employed to foster a student-centered learning environment (Rahman & Mohamed, 2014). Such pedagogy is intended to produce a combination of traditional and online education by effectively utilizing students' time not only inside the classroom but also outside their scheduled class sessions (Tune et al., 2013). For example, in a computer interaction course, Day and Foley demonstrated that students in the flipped class score higher on course evaluation outcomes, as compared to their counterparts in the control group (Day & Foley, 2006). Similarly, in an introductory biology course, Moravec and colleagues implemented out-of-class lectures, followed by in-class mini-lectures and activities. Results showed that performance on exam questions that were related to flipped materials increased by 21% (Moravec et al., 2010).

Given the putative role of flipped classrooms in education, such pedagogical approaches may be beneficial to health professions courses. Often, such courses require students to develop practical skills; an opportunity that is limited when class time is spent on lectures and content delivery versus skill building. As such, evaluating the efficacy of flipped classrooms in health profession courses can provide the potential for improving student in-class skill building opportunities, while still covering the content essential for learning. While to-date, the flipped class has shown to be effective in K-12, little evidence exists for its place in health professions programs of higher education. To address this need, this study aimed to evaluate the role of flipped classrooms in an undergraduate epidemiology course at a public institute of higher learning.

Methods

Study population

The study population consisted of 254 undergraduate students enrolled in an epidemiology course for a span of two quarters (22 weeks); thus, two sessions. The course is a requirement for all public health, healthcare management, and environmental health students, thus providing a diverse background of student body. In addition, students from nursing, biology, and nutrition, etc. often enroll in the course as an elective option. Students in the course are third year or more in their academic year (not graduate students). The primary reason for limiting the flipped pedagogy to undergraduate students was the background of students. Often in Master or Doctorate level courses, students have significant background in course content (either through undergraduate preparation or job experiences) and/or have developed refined learning techniques. Moreover, undergraduate students taking epidemiology often encounter the depth of the content for the first time in their academic preparation and thus the flipped classroom can provide an opportunity to assess learning of new topics. The institution at which this study was conducted is largely populated by primarily first-generation Hispanic students .

This study was a pre-post quasi-experiment in an undergraduate epidemiology course, with the use of historical controls. Data from two quarters (Fall and Winter) were collected. In the program, the majority of students engage in an internship in the Spring quarter. As a result, the quarter was not included as part of the study due to the potential bias introduced by experience students may gain in epidemiology at their site of internship. The study was approved by the Institutional Review Board of the institution.

The epidemiology course was designed with lectures recorded using PowerPoint and light board technology. Each lecture topic was divided into several 5-10-minute videos and posted online for students. In addition, lectures in text format were also provided online utilizing SoftChalk technology, thus enabling integration of quizzes that allowed students to assess their learning. The videos and lectures also complemented each other, instead of repeating materials; thus, ensuring students would need to review both prior to class. Before attending class, students were also required to take an online quiz that assessed basic knowledge from lectures.

In class, students were provided a learning activity prior to any review of content. This enabled the instructor to evaluate the degree of retention of content from online modules. Immediately after the first learning activity, class discussion ensued to review content that was identified as unclear from online materials. Following this, case studies were provided where students would be required to work in groups to answer questions based on their interpretation of epidemiologic data. This allowed students to practice and develop practical skills in identifying disease outbreak, determinants, and at-risk populations. For example, lecture videos on incidence and prevalence were provided as part of online module. In class, students were given case studies of two hypothetical geographical areas and provided with data on new and existing cases of an unknown disease. Students had to use recently acquired learnings in order to work in groups and to calculate the incidence and prevalence for each geographic location and, to determine which area is having an epidemic and make recommendations of public health efforts. During historical controls, the same lectures and assignments were given and assessments and grading were the same. However, lectures were presented in class while assignments were take-home (non-flipped) activities.

Pre- and post-tests were developed to evaluate students' perception of epidemiologic skills, in addition to the quizzes and exams. These tests were part of the regular course assignment and thus it ensured a 100% response rate. The "Statistics Attitude Survey" was adapted and modified for the epidemiology course to evaluate student's attitude, perception, and self-efficacy related to epidemiology; thus, in turn providing a foundational validation for such an assessment. To ensure privacy of students, no demographic characteristics of the students were collected for this study. The student population of the institute is primarily first-generation minority college students.

The pre-post survey was provided on Blackboard through the survey option and students were given course credit for their response. The survey option on Blackboard ensured that students received credit, but all data remained anonymous. In addition, only aggregated mean values were evaluated for this study, to further protect student privacy. Moreover, all analyses were conducted one full quarter after the end of data collection.

All quantitative analyses were conducted in SPSS version 24 (IBM, Corp.) and alpha less than .05 was used to determine significance. All survey questions were Likert scale, ranging from 1 through 5, 1 being strongly agree and 5 being strongly disagree. Mean rank values of pre- and post-tests were compared by utilizing Mann-Whitney U test to assess distribution and differences in responses from students; with a higher mean ranking denoting strongly disagree while lower mean rank represents strongly agree. Historical data on course grade distribution were obtained from Institutional Research to compare whether change in course delivery method (flipped class versus traditional) resulted in differences in grades. Only previous courses which had the same instructor as the flipped class were used as historical controls to ensure limited bias due to the instructor. Students' qualitative feedback data were aggregated and imported in NVivo software for analysis. Common words were identified by reading and re-reading qualitative feedback until saturation was reached. Next, the words were grouped to identify emergent themes. The instructor's perspective is provided as anecdotal support.

Analysis and discussion

As demonstrated in Table 1, students' attitudes and perceptions towards epidemiology as a subject and its usefulness significantly changed after the end of the class. For example, on average, more students reported agree or strongly agree on the usefulness of epidemiology in testing validity of studies heard in the media as well as

the epidemiology course being a requirement for their chosen profession. When asked whether taking additional epidemiology courses would be worrying, more students disagreed, which was further supported when significantly more students agreed or strongly agreed to take additional epidemiology courses, even if not required by their academic program.

As shown in Table 2, students' self-efficacy in epidemiology problem-solving also significantly increased after the end of the class. For example, more students agreed or strongly agreed that they were confident when solving epidemiologic problems, finding health determinants, and identifying limitations and biases in research studies.

Student perception of their study practices also showed differences in the post-test data, when compared to pre-test results (Table 3). For instance, at the beginning of the class, more students reported they did not find group work, in-class individual work, or online lectures useful. On the other hand, after the end of the class, significant increases in reporting agree or strongly agree was noted for all factors (group work, in-class individual work, and online lectures).

Finally, historical data demonstrates change in grade distribution. The instructor since Fall 2013 has been the same for the undergraduate epidemiology course. The traditional lecture method was utilized in Fall 2013, Winter 2014, Fall 2014, and Winter 2015. During each of these quarters, the average grade in the course was consistently B+. On the other hand, upon implementation of the flipped class, the average grade in the course rose to A- in Fall 2015 and Winter 2016.

Additionally, qualitative evaluation of student feedback showed two major emergent themes: pace of the course and collaborative learning. For example, students consistently reported that online lectures allowed them to learn content on their own time and review materials as needed throughout the course. Students also noted that the online quizzes allowed for further continuous review of materials without the fear and stress of in-person exam settings. Additionally, students stated that the in-class group activities were informative as the diverse student population (different majors) allowed them to problem solve a topic with different perspectives. Students further reported that the group activities provided scope for collegiality in a primarily commuter school.

Conclusion and recommendation

This study examined the role of flipped classrooms in an undergraduate epidemiology course at a public institute of higher education. To date, there are no current studies conducted to address its efficacy among this specific population. Using pre- and post-tests, students' perception and attitudes towards epidemiologic skills were examined. Overall, findings from this study present a promising future of the utilization of flipped classroom methodology among epidemiology students.

There were several key findings from this study. Students' attitude and perception changed in a positive direction when it came to the use of technology, pre-and post class work as well as group assignments and hence this is a promising step towards the efficacy of flipped classroom pedagogy among health science students. Students' problem-solving skills improved. Although there are no current studies conducted with a focus on epidemiology students, other studies based on other majors have found similar findings whereby students' self-efficacy in problem-solving skills increased at the end of a flipped classroom course. Therefore, other educators should consider implementing flipped classroom methodologies over a long period of time among this study population (Tune et al., 2013; Roach, 2014). Students' perceptions of group work, in-class individual work, and online lectures improved. This finding is supported by the literature which suggests that today's students gravitate towards in-class group activities as well as collaborative learning experiences (Roach, 2014; Roehl et al., 2013; Enfield, 2013). The class grade average in the course rose from a B+ to an A- over a 4-quarter period. These promising student outcomes are supported by the literature which suggested that the incorporation of a flipped classroom model contributed to the improvement in students' exam performance conducted in other studies (Davies et al., 2013; Tune et al., 2013; Rahman & Mohamed, 2014; Roach, 2014).

Overall, in the context of this study, active learning continues to evolve. As students received more opportunities to engage and become active thinkers, their perceptions changed. Consequently, as students stay engaged and actively participate in class activities, their self-efficacy improves and so do their grades. It is promising to learn that students were very optimistic about taking additional epidemiology courses demonstrating that they are eager to learn more. Therefore, as students' perception and overall grade improves, so too does their preference for a flipped classroom methodology.

From an instructor's perspective, the online lectures allowed for more in-depth study of epidemiologic topics, which is often inadequate due to limited class hours. In addition, the in-class activities which allowed for application of learned theories, grew students' interest in epidemiologic research, resulting in several students demonstrating interest in or even initiating faculty-supervised research projects in consecutive quarters. Despite the considerably large class size, the in-class activities allowed for one-on-one interaction with students, thus leading to a better faculty/student relationship and allowing greater scope for mentorship. Finally, given the high proportion of students who work, flipped classroom allowed the flexibility in schedule for students to continue to learn while not being limited by their work schedule; an asset for an institution serving a primarily low-income service area.

Nevertheless, the flipped class is not without its limitations. Creation of online materials and accompanying case studies require significant time commitment, adding to faculty workload. For example, one flipped classroom study found out that, although the class was interactive, instructors spent around two hours per lesson to produce videotaped

lectures and digital slide presentations (Roehl et al., 2013). Furthermore, not all students prefer online lectures and as such, this pedagogical approach may not be effective for students who prefer to learn best through direct lectures from instructors. Similarly, the results of this study should be interpreted in the context of its limitations. The quasi-experimental design limits causal reference due to lack of randomization. This study had historical control measures in place and thus the research team is unable to address any causal relationship. Furthermore, attrition of students, resulting from graduation or change of major, makes it difficult to assess long-term retention of learned knowledge and perception of the usefulness of epidemiology. Further studies using a true randomized controlled trial would be effective in demonstrating the causal relationship between such innovative pedagogy in health professions-related courses.

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Appendices

Table 1: Attitudes and perceptions towards epidemiology.

	Mean rank		p-value
Question	Pre	Post	
I don't know what Epidemiology means.	120.2	133.3	0.0052
I don't see the reason why I have to take an Epidemiology class for my career choice.	125.7	127.4	0.5460
Epidemiology will be useful to me to test the validity of studies I hear in the news.	136.0	115.1	0.0118
I might use Epidemiology at my job but wouldn't like doing it.	124.4	128.8	0.6057
Epidemiology will be useful to me when I describe my professional activities to other people.	125.2	125.9	0.9312
Epidemiology will be a useful tool that I can use to improve the quality of measures that I have or may develop in my profession.	131.4	120.2	0.1726
Epidemiology is so useful that it should be a required part of my professions skills.	142.8	111.2	0.0002
I find Epidemiology to be very useful in my profession.	134.9	115.5	0.0228
Epidemiology may be useful to someone who plans to pursue a career in research, but not very useful to the average healthcare professional.	135.4	114.8	0.0173
The average healthcare professional would find Epidemiology a boring subject.	124.6	128.6	0.6422
The thought of taking another Epidemiology course makes me feel worried.	112.6	141.5	0.0005
I think Epidemiology is very logical and clear.	144.4	105.9	0.0000
Given the opportunity, I would take another Epidemiology course even though it wasn't required.	138.5	113.5	0.0041
I am interested in an Epidemiology career, such as working at CDC as an Epidemic Intelligence Service agent.	125.1	128.0	0.7408

Table 2: Self-efficacy for epidemiology.

	Mean rank		p-value
Question	Pre	Post	
I am not confident in solving an Epidemiologic problem.	106.1	148.6	0.0000
I am confident that I can easy solve a population health problem when presented to me using Epidemiologic reasoning.	146.3	105.1	0.0000
I am confident that given a health problem I can easily find the determinants.	148.6	99.2	0.0000
I am confident that given a research study, I can find the limitations and biases in the study.	158.8	90.8	0.0000
I am confident that the items I learn in this course will be useful to my career.	131.1	118.5	0.1290

Table 3: Epidemiology study practice.

	Mean rank		p-value
Question	Pre	Post	
An average student can expect a good grade in Epidemiology if he/she studies.	147.8	105.9	0.0000
I find group work to be useful in learning concepts.	136.3	115.9	0.0000
I find homework to be useful in learning concepts.	131.0	120.5	0.0000
I find in-class individual work to be useful in learning concepts.	137.1	114.1	0.0000
I find online lectures to be useful in learning concepts.	145.7	104.9	0.1290

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Introducing the discovery case study: Brompton folding bikes

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Introduction

This provocative instructional guide seeks to offer a learning design solution to the problem of student disengagement with case studies, and in particular, addressing the reluctance observed in some student groups to prepare for performative social learning encounters. It draws not only on the experience of the authors, but also on the shared experiences of case study delivery from various teaching focussed staff forums at Surrey Business School, University of Surrey. This paper briefly discusses a range of potential options before proposing the idea of a discovery case study. An example discovery case brief is presented and then supported with reflective teaching notes on how to optimally use this innovative approach.

By situating a learning challenge in a real-world context, case-based pedagogies can help learners prepare for jobs that do not yet exist by developing versatile problem-solving skills and experience (Schwartz, 2019). Often written using an empathetically compelling story of a business conundrum, case-based dilemmas can uniquely be told through the lens of an individual, giving a reasonably realistic sense of management in practice. Bonney (2015) found that a case study approach was not only more effective in promoting learning, but also developing written and oral communication and the ability to connect abstract concepts into the real world. However, Business School case studies usually comprise a narrative followed by discussion questions, perhaps containing circa 2,500 words typically, and longer Harvard Business School MBA style cases may stretch to beyond 30 pages. The authors surmise that this upfront independent engagement hurdle is one that time pressurised students can particularly struggle with.

Problem statement

University students studying at business schools are not always enthusiastically engaging with the pre-assigned reading, with studies showing as few as one in five (20%) of students undertake pre-class readings (Deale & Lee, 2021). Zeivots (2021, p. 1) laments the influence of technology, media, and apps as factors that have negatively impacted academic reading, noting that contemporary students "often struggle to read anything beyond an excerpt". This can be particularly problematic when a participative, experiential, or flipped classroom concept is being deployed, where, by fundamental design, the in-class interaction is reliant on building from prior knowledge gleaned from independent learning preparation. The phenomenon of a reduced appetite to prepare for live learning encounters, observed first-hand by the authors in Business School students in several different UK domestic and international settings, has also been seen to grow over the course of a term or semester, perhaps understandably because more attention is given to looming, terminal assessments.

Thus, tutors are faced with the problem of low social interaction between themselves and the majority of students in the learning space. This diminished in-class interaction manifests in low emotional energy, so it is difficult for the tutor to energise the class from the outset (Collins, 2004). Reaching that moment of energisation or collective effervescence, in Interaction Rituals Chain Theory (IRCT) terms, is difficult, hard work, and almost never materialises in this context. In such cases, the ritual of 'going to class' can be classified as a failed ritual - the lights are on, but nobody is at home (Collins, 2004).

Shernof et al. (2017) posit that students "taking notes, actively listening, and working on problems appeared to create a higher quality learning experience for themselves". Whilst Hoeft's (2012) study, focussed on why University students do not read, identified the primary explanation for unpreparedness given by students was that they were 'too busy', their energies are directed elsewhere.

This relatively frequent behaviour has been found to be a particular problem for small group case seminars, which can be as short as 50 minutes long in duration. When additional time has to be allocated to allow unprepared students to skim read the case content on arrival, it squeezes the available space for the high value social learning that students seem to appreciate, and even often enjoy when fully engaged with

case-based learning. Unfortunately, divergent attitudes to the importance of being prepared can create sub-optimal, two-speed learning environment that may problematically lead some students to value their formal instruction less highly.

Moreover, where there is diversity in English language capability within the cohort, as is often typical in Business Schools, required reading and processing times can vary significantly. This can result in simultaneously too much and too little absorption time being allocated, whilst the tutor iteratively briefs any late arrivals. This may further compound the challenge tutors already face with diverse international groups whose different cultural learning scripts can result in some students demonstrating their impatience and frustration (Read, 2020). Students who have arrived prepared are indeed eager to engage, often demonstrating a higher level of emotional energy. But if it is apparent that some participants are unprepared, this can lead to a stark reduction in the quality of discussions and result in a dilution of learning effectiveness. Activated participants can demonstrate their frustration at having to disproportionately contribute in-class. When this situation is repeated it may negatively impact their experience and willingness to continue to prepare and participate in future encounters, creating an undesirable negative reinforcement cycle.

At the same time, as students are increasingly being positioned as consumers of a Higher Education service, some faculty may feel less able to set and enforce historical behavioural norms, such as encouraging students to leave if they are not prepared and join a later class. Tutors who attempt to sanction unhelpful behaviours, from students who increasingly see themselves as customers, also risk being virally vilified in the court of social media.

Solutions:

A number of alternative viable solutions are used that address the unpreparedness challenge, to some degree, and are certainly worthy of consideration for inclusion in a varied learning diet:

- Use short and very short cases – e.g., SAGE express cases (SAGE, n.d.) or concise one page news and business journal articles. This approach benefits from leveraging contemporary issues of the day, but at the cost of less deep engagement.

- Assess passive student attendance and/or in-class contributions and/or low stakes pop quizzes, solutions that are popular in North America, but difficult where solo staffing is the norm. It also goes against a UK Higher Education trend to explicitly avoid 'over assessing'.

- Perform an introductory 5-minute case summary 'review', perhaps using a short video and ideally drawing on student summarisation. However, this approach can perpetuate the expectation that substantive preparation is not necessary and reduce engagement further.

- Use a multi-module case example that several tutors deploy with a cohort, however, engaged student feedback here seems to indicate a desire for more variety rather than convenient repetition.

Taken in the round, all these robust and credible interventions have identifiable short comings and they do not offer the rich learning that can be gleaned from a more profound and immersive case experience. It is likely that former students-turned-educators of business will recall the light bulb moment when they cracked the 'weight not space' constraint in the FedEx case, or Honda's memorable emergent strategic conquest of the North American market, that was achieved through small scooters, and with not the big bike plan. Immersive storytelling takes time to connect with an audience profoundly and be transformative, and employers value the ability to solve complex, never seen this before problems (Mintzberg et al., 1996). Rushing too quickly to the answers in a thrice risks undermining the exhilaration that can come from the transition from frustrated head banging to unlocking a substantiated, viable solution (n.b. not 'the' solution). Interventions that mascaraed as the thinnest veneers and that lend themselves to simplistic and formulaic solutions may drive adequate student satisfaction ratings from the majority, but they also endanger profound learning and development. And one of the most important benefits of a case study-based pedagogy, in the authors' opinion, is to develop the ability to absorb and analyse an array of informational elements in a more lifelike format and context. Working in groups, students also can develop their soft skills (e.g., listening, persuasion, negotiation, and team working) that are often cited as major employability shortcomings from traditional university programmes (Keevy, 2016). It is important to note that the 'real world' does not usually, systematically, serve up bite-sized executive summaries that highlight all the salient information, with a clear problem statement and compelling solution. So, another happy path is needed, one that removes the roadblock of pre-reading, but retains the more profound benefits afforded by case learning pedagogies.

Differentiating a discovery case study

A discovery case study is distinctive from a traditional case study in that students are confronted by the questions first (rather than last) and then introduced to a modest range of resources that may help them, working together as a cohesive team, address the set questions. Again, different from traditional case studies, where all the necessary information is included within the confines of the case documentation, successful groups need to collaboratively mine their information sources (and perhaps use their own initiative to find others) whilst simultaneously putting in practice effective group working skills to build a clear

picture from their informational jigsaw pieces. Discovery cases do not implicitly assume that students already possess higher order group working skills, and therefore explicit focus is given to the lived group process in addition to the recommendations/question answers. Dolmans et al. (2015) might note similarities with Michaelsen's Team Based Learning (TBL), however, prior student preparation is presumed in TBL (Parmelee et al., 2012).

In framing the problem initially in the form of questions, students can be motivated to research with purpose, and within their group benefit from rapid peer feedback during discussions. With the tutor able to provide feedback, observations on the group processes, along with hints and tips on how to overcome any hurdles, their interventions can satisfy any needs for instant gratification and encouragement. With a high degree of self-directedness, rapid cycle peer and tutor feedback, an interactively facilitated classroom, and effective group leadership / management, discovery case studies can to some degree claim to directly address at least half of the top eight motivating factors for adult learners identified by Sogunro (2015).

Agile discovery case studies can evolve from a topical news item, guest speaker, business magazine feature, or YouTube video, and be embedded in the virtual learning environment quickly. Requiring a modest number of linked resources and no carefully crafted story narrative, once four or so questions have been developed, a discovery case can easily be created in half a day or less. Deployed systematically, this approach can also assist in a process of catalysing the ongoing refresh and development of the module curriculum.

Tutors who are familiar with the flipped classroom concept are likely to feel comfortable embracing the 'guide on the side' role that dynamically seeks to assess the way a group works in addition to the end-product, question responses (King, 1993). Learning facilitators need to be happy in their skin and feel comfortable to co-ordinate more loosely directed learning rather than play the 'sage on the stage' persona, and be relaxed working in an ambiguous, shades of grey co-creational environment where there are many ideas, not just a single right answer (King, 1993). Explicit process and skills focussed learning outcomes should progress over the course of a semester or term, with time given over to reflective discussions on the 'how' (process) as much as the 'what' (knowledge).

Delivering the discovery case study concept

The discovery case should be ideally attempted by student groups of 3-5, who are able to arrange their seating to be able to see each other's faces and speak and listen to one another comfortably. This probably means trying to arrange the class in a flexible seating space (with comfortable bean bags and sofas preferably) that has double the capacity of the actual number of students attending. It is always good practice to encourage the development of a circle of trust for each and every learning encounter, and this should be achieved by introducing members names and a short icebreaking activity (e.g. introduce your shoes or favourite superhero).

The tutor might kick off the flipped case by playing a video short on a big screen, ensuring that the volume is pre-set for clear and comfortable acoustics. YouTube (or similar universally accessible video sharing platform) host popular, short form multi-media content that is becoming increasingly popular, and this resource may be mined for informative and evocative concise summaries (2-5 minutes), that whilst not comprehensive, may be sufficient to carry students over the break-through threshold. Activating the video subtitles function during playback and capturing a transcript of the video may further enhance the accessibility of the content.

In the following section the student facing briefing materials for a discovery case study about Brompton folding bikes is presented using URL links (live at the time of publication) to a pithy magazine story and supported with a number of YouTube video shorts. This discovery case was specifically designed for a master's level digital marketing module, an intervention that fell towards the end of the semester during assignment season.

An example of discovery case study student facing briefing materials [a]

BROMPTON FOLDING BIKES

Address the following questions [b] in your social learning groups:

(1) Evaluate the effectiveness of your group's processes in extracting and analysing key information. What would you do differently next time?

(2) Why, in 2017, was the Brompton brand in bad shape? Give specific examples of the challenges faced by the business and clients.

(3) Using simple side-by-side customer journey maps, identify how a typical Brompton rider's journey differs from someone using a non-folding bike.

(4) What are the general says and does/hears/sees/thinks and feels/pain/gain points (customer empathy mapping framework) that the 'A day in the life of a Brompton owner' video series identifies about cycling (any bike) in a city?

Useful resources [c]

Please read this short article two or three times by Davis (2017) How Brompton Bicycles is overcoming purchase friction using content and social featured as part of econsultancy.com's content marketing. Allocate group members to carefully watch two videos each, making sure your group watches all six videos. [d]

UGC Brompton user video: https://youtu.be/z3ZncvrdBI0
Roos, Amsterdam: a day in the life of a Brompton owner: https://youtu.be/SxP8LigkZAo
Wil, Berlin: A day in the life of a Brompton owner: https://youtu.be/KZcy-aZyx74
Andy, London: A day in the life of a Brompton owner: https://youtu.be/pKxuf5Wozbc
Camille, Paris: A day in the life of a Brompton owner: https://youtu.be/noQhs_zd9SE
Day in the life: Shanghai: https://youtu.be/VReM2zhZdfs

Intended Learning Outcomes [e]

After this learning intervention, you should be able to:

(*) Evaluate your own group's planning and performance and be able to recommend better next time steps

(*) Identify, evaluate, and summarise problems faced by a real business using secondary information sources.

(*) Create and compare two customer journey maps.

(*) Use the empathy mapping framework to analyse a customer consumption experience.[f]

Teaching delivery notes

To emphasise this more ambiguous learning context, the authors decided it was not appropriate to provide a model answer, and therefore the contained teaching notes are entirely focussed on presenting tips and explanations using alphabetic context notes in square brackets.

[a] The discovery case is distinctive because it presents itself as a concise, one page brief that would sit comfortably in the top level of any virtual learning environment (VLE). Ideally it is presented in a form that is not overwhelming for students, with sufficiently stretching questions that will challenge the most able groups presented first.

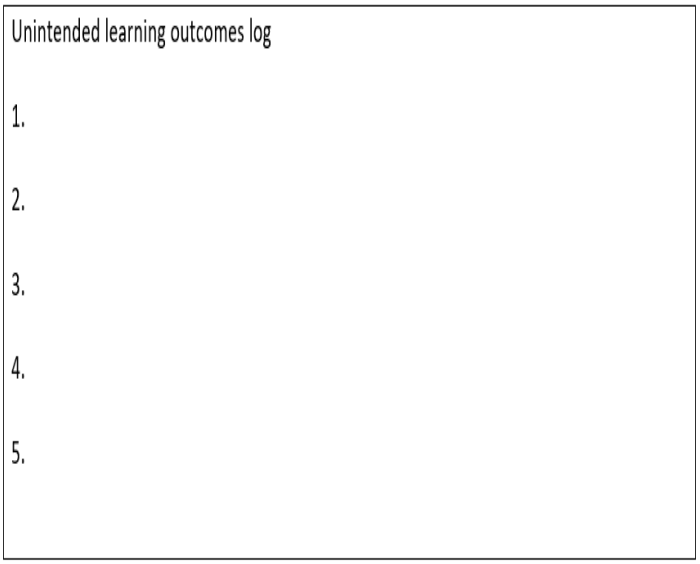
[b] The often overlooked, implicit expectation for most teaching case study publication houses is that all the information required to address the set questions is included in the case text. Without a front-loaded case text, discovery cases brazenly break this often-unspoken rule, and challenge the idea of working towards a pre-determined, single right answer.

[c] Gone are the days when accessing the internet required a difficult to arrange timetable shift into the cramped computer labs, densely packed-out cheek by jowl with old-fashioned technology. Embracing the concept of BYOD (Bring Your Own Device) enables all the class to access the initial brief (on the VLE, not on the big screen), watch video clips and undertaking further research. In addition, it can also helpfully occupy a channel otherwise being used for other off-task purposes and encourage deeper group collaboration. In our experience, students usually have not just one suitably wifi-enabled device, but often two or three, however if technology (or power) accessibility is an issue then a computer lab may be a more convenient space to work in.

[d] A strong pointer is provided to suggest that, akin to a realistic work situation, there is not sufficient time for each individual to review all of the resource materials. This light touch direction is likely to see a range of different approaches utilised, specifically what were the different ways the groups used to agree to allocate work and how did they capture and share key information. The aim of the discovery case is to integrate a range of self-discovery lessons in group working. The tutor may expect to see an interesting discussion evolve around this topic.

[e] Primacy is given to process reflexivity to signal both its importance and simultaneously ensure that sufficient time is devoted to considering insights profoundly. If there is not sufficient time left to discuss the final question(s), then this might be covered in beyond class learning via a short wrap video from the tutor, or by encouraging all of the seminar group members to contribute to a discussion forum. Again, this reinforces the importance of the process and reflexivity (learning to develop an 'ever better' philosophy to group work) rather than being spoonfed any pre-determined answer.

[f] Tutors should be prepared to identify, and capture in a log, a range of unintended learning outcomes, recognising that the more open, creative, co-creation process they are unleashing is likely to uncover serendipitous learnings. These insights could be used to inform the design and delivery of future discovery cases and form the inspiration for a pedagogic evaluation of their classroom implementation.



Extension questions for longer classes or assessments:

(5) What are the specific advantages (or unique selling points) and disadvantages (detractors) for Brompton's folding bike that are uncovered in the video-linked testimonials? How are these addressed?

(6) What persuasive marketing techniques are evident in Brompton's video-based campaign? Is this user generated content (UGC)?

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In modern times, the nature of higher education around the world has been largely determined by the models established in influential countries such as France, Germany, Great Britain and the United States of America (Pechar & Park, 2017; OECD and European Union, 2019). This book, titled Understanding the higher education market in Africa, offers theoretical and practical insights into the dynamics of higher education, especially the marketing of higher education, in this comparatively less-researched continent. It explores the key players, challenges and policies affecting higher education across the continent; their marketing strategies and the students' selection processes.

The authors E. Mogaji, F. Maringe and Robert Ebo Hinson are well-known scholars in the fields of higher education and marketing. Emmanuel Mogaji holds a PhD in marketing, and he is a Lecturer in Advertising and Marketing Communications at the University of Greenwich. Felix Maringe is a Professor and Head of Wits School of Education and Research and Assistant Dean at the University of the Witwatersrand. Robert Ebo Hinson is a Professor at the University of Ghana Business School.

This book, totalling 307 pages, comprises four main parts and an introduction and conclusion. The introduction, written by the editors themselves, talks about the history of colonization in Africa and how formal education came to be. Set against this background, it examines the idea of marketisation, how it emerged and settled in the higher education sectors of the continent, its emphases and omissions.

Part 1 is about private and government involvement. The authors assert that education is vital for national development and that it is a human right which unlocks individual potential and benefits for all of society, powering sustainable development. Thus, there is a strong need to conceptualize the market dynamics governing public and private universities. It is said that the price signal influences the two-tier universities' growth and that this signal has different impacts on the different stakeholders. Educational products have demand-based and supply-based attributes. The demand-based attributes rotate around tuition fees, service personalization, student satisfaction and experiences, and brand image whereas the supply-based attributes cnetre on place, price, service quality, brand reputation and competition.

Part 2 talks about students and staff as stakeholders. Among other things, it delves into partnerships with other universities. It contains this noteworthy quote:

> In the first two decades of democracy, much of the focus was on broadening and diversifying student access. There is much reason to celebrate significant achievements in this area, although much is yet to be achieved, especially concerning improving quality, student success rates and better pipelines into postgraduate study and research. Less progress has also been made concerning the renewal of the professoriate, and the representation of black people and women in the senior echelons of the academy remains alarmingly low (p. 87).

Part 3 is about positioning for added advantage, in order to achieve success in the higher education system in the continent. Whereas some universities in Africa aspire to become world-class institutions, some have the vision to become an international choice. The latter is different from just providing world-class research in Africa, as also other stakeholders and partners outside Africa recognize them and will be willing to partner with them. For example, the University of Johannesburg has the vision to become "an international university of choice" while University of Nigeria's vision is to "become a globally reputed first-rate university".

Part 4 focuses on marketing strategies for universities. Against this backdrop, this part distils how skills in educational marketing at the University of Ghana and Learning Centres (UGLC) at the School of Continuing and Distance Education of the College of Education are shaped. The book's conclusion is again authored by the editors. In this interesting finale, the discussion on the colonial imprint on the African continent should not be missed, highlighting the role of education within colonialism:

> Colonialism imposed its control of the social production of wealth through military conquest and subsequent political dictatorship. However, its most important area of domination was the mental universe of the colonized, the control through culture of how people perceived themselves and their relationship to the world. Economic and political control can never be complete or adequate without mental control (p. 283).

Whilst the conclusion is worth reading, I do not concur with some of its parts because they potentially create sentiments of disunity with other parts of the world. Even so, in this modern time, the nature of higher education in Africa has been largely determined by the models established in influential countries, referred to as 'the colonial masters' in this book. Overall, I recommend this book, especially to those interested in the advancement of higher education in Africa.

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Sam C. Y. (2021). Teaching higher education to lead: Strategies for the digital age. Business Expert Press

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We live in an age of information overload and technological innovations are changing our world at breakneck speed. The use of digital tools has begun to play a key role in higher education. Dr. Sam Choon-Yin's book *Teaching higher education to lead: Strategies for the digital age* which was first published in December 2021 is a very timely, relevant and insightful book. Sam Choon-Yin is the Dean (Academic Partnerships) at Kaplan Singapore. His book is addressed at everybody with an interest in higher education and provides an intriguing perspective. It links technological development to demand for education, credentials of higher education, and jobs while touching on issues of strategies and higher education policies for the digital age. By drawing attention to the changing structure of teaching and learning in universities and various emerging challenges, the author sheds light on how education can be effectively carried out in the digital age to serve the needs of students and hiring companies and ultimately the institutions of higher education.

Teaching higher education to lead: Strategies for the digital age has eight chapters and a rich bibliography. The other parts of the book include testimonials, preface, epilogue, a section about the author and a detailed index. In the beginning, the book provides the readers with a precise description of some of the key concepts: higher education; leadership and digitalization. A key research question of the author is how universities may remain competitive and relevant in the age of digitalization.

Chapter 1 is entitled "University education—then, now, and the future". It provides significant insights regarding the history of higher education in Europe, Asia and the United States. In addition, it covers the purposes of education, from the training of clerics to maintain order to the training of students to enter the workforce. With reference to classical thinkers such as Adam Smith, the author explains what education has to offer, including the aim to lay a foundation for a decent society. The author argues that higher education institutions were deeply affected by the COVID-19 pandemic and he provides some ideas on the role of education in the post-pandemic world.

Chapter 2 addresses the topic of credentials and qualifications in higher education. The author begins the chapter with a thought-provoking question: Who could be against higher education? Sam writes that the "notion that attainment of academic qualification does not automatically lead to higher payoff, especially for qualifications that are not entirely helpful in one's career, has been elevated as the hard truth of today's complex and competitive society" (p. 19). He gives examples from transnational corporations with global reputations to support his argument: Alphabet does not hire people because of their educational credentials, but looks for the candidate's learning ability. An important insight in this chapter is that it is the drive for commercial objectives that is partially responsible for the weakening of higher education credentials. The author concludes that educational leaders play a vital role in combating perceived failures of higher education institutions as they are among the people who have the capability to strike the right balance between commercial and educational interests.

The issue of jobs and technology is addressed in chapter 3. In this chapter, Sam focuses on how technology is taking over our jobs. He covers the history of the fear of automation creating massive unemployment. We are reminded of a number of thoughts about the fear of workers being displaced by technology. According to Bill Gates, "job replacement is coming too fast to the extent the technological disruption ought to be controlled and even slowed down" (p. 37). At the same time, chapter 3 argues that technology also has a positive impact on creating new job opportunities.

Chapter 4 is entitled "Staying relevant in the digital age". Sam contends that despite the many criticisms that question the relevance of universities, people's lives continue to be transformed through higher education. The author also sheds light on the ways of how universities can stay relevant in the digital age. For one, universities should offer the courses that employers need. In addition, universities need to impart digital skills that students need, teach students metacognitive abilities how to learn and help them develop soft skills and adapt to the pedagogy of online teaching.

Chapter 5 highlights the passion for learning. According to the author, a "passionate learner asks tons of questions, and (like Socrates) is more willing to admit that he or she does not know everything" (p. 71). In this chapter, we are reminded that with passion, the learning progress can be extremely enjoyable. Education is conceptualized as self-actualization (the highest need in Maslow's hierarchy) where learners go through a demanding period of preparation in order to realize their potential.

Issues of learning in the digital age are dealt with in chapter 6. Like in previous chapters, critical highlights are presented. One of them is about how the human brain works. Others include how people learn and how the internet affects our ability to learn. The author provides some statistical data showing the prevalence of technology and internet usage around the world. For example, in Singapore, a person spends a shocking average of 12 hours 42 minutes a day on their digital devices such as mobile phones, tablets, and computers. The author concludes that the internet can be a powerful tool to supplement traditional learning if used in a meaningful way.

Chapter 7, entitled "Good to great teachers", discusses what teachers do. The author focuses on the question of 'what makes a good teacher great?' and argues that a great teacher refrains from labeling students as lazy and employs a variety of teaching methods while teaching students how to learn. In this chapter, important insights are presented about measuring teaching effectiveness. One of them is to consider teachers' contributions to student achievement. The author also provides some useful models in table form that conceptualize educational effectiveness and a framework for teaching.

"Leadership in higher education" is the focus of the final chapter. It begins with a significant assessment: "Balancing the business and educational goals of higher education institutions (HEIs) in the private sector is one of the greatest challenges for HEI leaders" (p.125). The author sheds light on some improper practices in higher education and notes that in Chile and Mexico, the expansion of the private education sector has not led to improved quality. One of the arguments presented notes that when commercial goals constitute a major part of the business, there is a risk that the commercial goals may override educational interests. The author argues that it is important for HEI leaders to understand what it takes to be responsible leaders. A responsible higher education leader strives to balance commercial and educational demands, giving neither more emphasis than the other.

Teaching higher education to lead: Strategies for the digital age is a very significant book that provides major contributions to our understanding of higher education. One of the contributions is the sharing of the author's experience and insights about the challenges of education, particularly during the COVID-19 pandemic that led to major changes in the delivery of higher education through online teaching. The pace of digitalization of teaching and learning requires administrators, educators, and students to adapt to the new ways of delivering education. Sam Choon-Yin's book provides a strategic perspective addressing the most recent issues of higher education. I highly recommend reading this fabulous book for a unique view on our lifelong educational journey.

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Orwell, G. (2021). Such, such were the joys: A graphic novel, adapted by Samuel Michael Wilson. Illustrated by Jaime Huxtable. Pluto Press.

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Figure 1: Extract from p. 47.

> Whoever writes about his childhood must beware of exaggeration and self-pity. (*I do not claim that I was a martyr or that St Cyprian's was a sort of Dotheboys Hall.*) But I should be falsifying my own memories if I did not record that they are largely memories of disgust. (Orwell, 1952)

There is a fair bit of criticism of George Orwell's somewhat autobiographical account of schooling in St Cyprian's. Some decided that he did not take heed of his own advice on exaggeration rendering it no more than a disclaimer. Sam Leith (2014) went as far as to declare the posthumously published work to be "sodden with self-pity", thus "Orwell's account of his prep school years is fascinating but not to be trusted.

Cyril Connolly, who attended St Cyprian's, then Eton together with Orwell and with whom he shared a friendship, recounted his own regret borne from erroneous memories of St Cyprian's and the Wilkeses - headmaster Sambo and his wife Flip. He wrote in an article for the New York Times in 1972:

> When I read this account of Orwell's school days, drawn so largely from his and mine, I was at first enchanted as by anything which recalls one's youth; but when I went to rectify some references from old reports and letters, I was nearly sick…
>
> In the case of St. Cyprian's and the Wilkeses whom I had so blithely mocked there is an emotional disturbance. I received a letter of bitter reproach from Mrs. Wilkes after "Enemies of Promise," which I have never dared to reread and when, after the death of my own parents their papers descended to me, I found evidence of the immense trouble she had taken to help me win my scholarship to Eton despite the misgivings of my father which had to be overcome.
>
> The Wilkeses were true friends, and I had caricatured their mannerisms, developed for dealing with generations of boys, and I had read mercenary motives into much that was just enthusiasm. What they would have made of Orwell's more severe strictures, published in England only after his death in 1950, I have no idea, I hope they never saw them (Connolly, 1972).

This is an interesting book to review because there is the book, graphical no less, and then there is the original essay. Do I then cast my two pennies upon Orwell's words or Jaime Huxtable's glorious illustrations or the adroitness of Sean Michael Wilson's adaptation? In order to preserve the integrity and wholeness of the endeavour, I believe I need to do all of the above, over two convenient sections: (i) the essay and (ii) the book.

I draw from an online version of the essay (Orwell, 1952) to compare against the book; words found in the essay but omitted from the book are in parenthesis and italicised. Illustrations from the book are then reproduced for ease of study.

The essay: An Orwellian narration of Bourdieusian habitus and capital

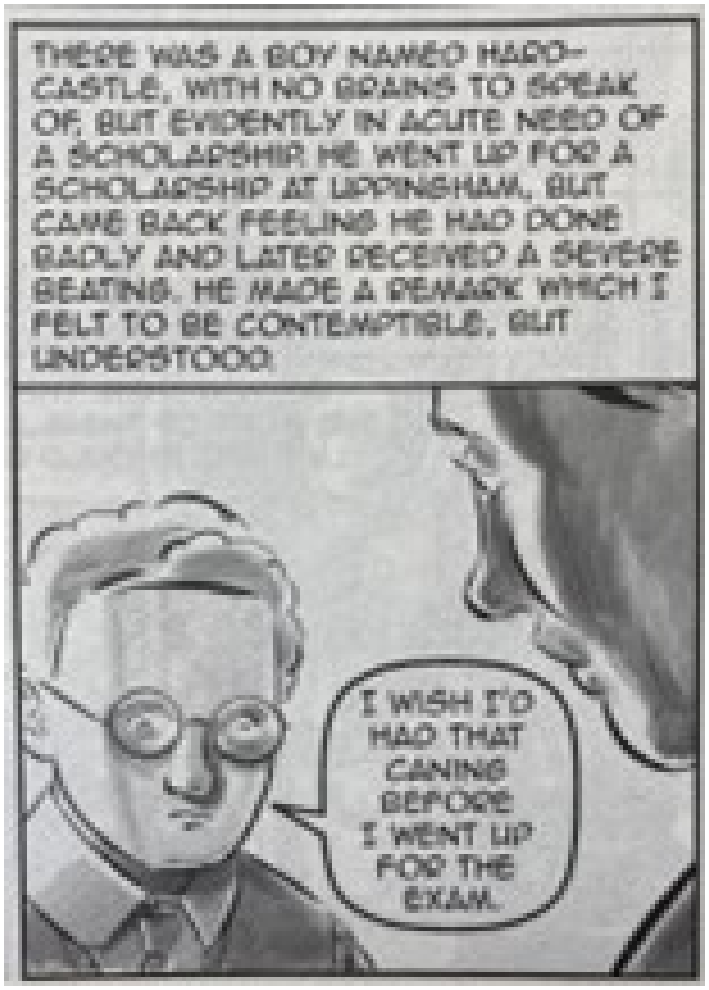

Figure 2: Extract from p. 27.

> There was a boy named Hardcastle (*Beacham*), with no brains to speak of, but evidently in acute need of a scholarship. (*Sambo was flogging him towards the goal as one might do with a foundered horse*.) He went up for a scholarship at Uppingham, came back with a consciousness of having done badly, and (a day or two) later received a severe beating (*for idleness*). 'I wish I'd had that caning before I went up for the exam','he made (*said sadly* —) a remark which I felt to be contemptible, but (*which I perfectly well*) understood (Orwell, 1952).
>
> (*The boys of the scholarship class were not all treated alike. If a boy were the son of rich parents to whom the saving of fees was not all-important, Sambo would goad him along in a comparatively fatherly way, with jokes and digs in the ribs and perhaps an occasional tap with the pencil, but no hair-pulling and no caning. It was the poor but 'clever' boys who suffered. Our brains were a gold-mine in which he had sunk money, and the dividends must be squeezed out of us. Long before I had grasped the nature of my financial relationship with Sambo, I had been made to understand that I was not on the same footing as most of the other boys*.) In effect there were three castes in the school. There was the minority with an aristocratic or millionaire background, there were the children of the ordinary suburban rich, who made up the bulk of the school, and there were a few underlings like myself, the sons of clergyman, Indian civil servants, struggling widows and the like (Orwell, 1952).

Very quickly into the essay, Bourdieu's construct of habitus was screaming in my mind. The doxa of walloping as being well-deserved and accepting that such treatment is rightfully reserved for those "not on the same footing" predispose the dominated to know their place. This misrecognition limits the underlings' agency so that the hierarchy that places them at the bottom to begin with, can reproduce itself.

Figure 3: Extracted from p. 28.

> The habitus is the product of the work of inculcation and appropriation necessary in order for those products of collective history, the objective structures (e.g. of language, economy, etc.) to succeed in reproducing themselves more or less completely, in the form of durable dispositions, in the organisms (which one can, if one wishes, call individuals) lastingly subjected to the same conditionings, and hence placed in the same material conditions of existence (Bourdieu, 1977, p. 85).
>
> … all human action is situated within determining structures that are not readily available to everyday consciousness (Swartz, 1997, p. 57).

The habitus affords irregularities in and unpredictability of agents' actions whilst concurrently limiting these possibilities such that they tend to reproduce existing social milieux (Reay, 2004). Agents exclude practices that are alien to their habitus and fail to recognise the resultant loss of freedom. Forms of agency are not equally possible and impossible because capital is constantly accumulated and converted from one form to another within an "accumulated history" (Bourdieu, 1997, p.46). Bourdieu argues that there can only be limitless possibilities and equal opportunity if moments in history are unique and independent of one another; a society that is devoid of accumulation or inheritance of capital so that no agent is favoured in the competition. However, today's availability of resources that are needed for desired actions is the result of yesterday's endowment, there can be no true competition where all outcomes are equally possible. Hence actions cannot be disinterested.

Bourdieu conceptualises capital as resources that are "objects of struggle" (Swartz, 1997, p. 74). He sees the forms of capital as material (economic), cultural, symbolic, and social. Bourdieu proffered that there exists a "political economy of culture" (Swartz, 1997, p. 67) within which apparent altruistic actions beget more cultural capital. This noneconomic form of capital can be expended in return for power and domination, enabled by resources such as language, aesthetics, "cultural awareness", and "educational credentials" (Swartz, 1997, p. 75). However, such violence is often misrecognised as virtues, thus legitimised and justified. Cultural capital then functions as social capital.

Social capital, put simply, is "membership in a group" (Bourdieu, 1997, p. 51). The volume of social capital that one possesses is dependent on one's ability to mobilise the other members in the network, dependent on "the power to impose (his/her) will on others". This power is in turn dependent on the volume of their other forms of capital - both economic and cultural - which the aristocrats and rich suburban castes own in large amounts. Consequently, the underlings should not confuse their enrolment in St Cyprian's as membership. Rather, they need to know their place and be grateful no less.

Bourdieu's constructs are not an allusion that true agency is not possible. It is a treatise that fully rational decisions and subsequent actions that are free of interest are not immediately available as "agents are differently positioned to be reflexive about their practice" (Rawolle & Lingard, 2008, p. 731). Emancipation lies in the possibility of an awakening; a Freirean conscientisation to empower the overcoming of "an irrational fear of freedom. A fear that those who possess it are reluctant to admit to, or otherwise unconscious of, and misrecognising the status quo as self-existent, to be preserved and protected" (Ang, 2021, p. 74). The imperative of severe caning in securing scholarships is not self-existent. Dialogue underpins this awakening, which is rendered impossible by St Cyprian's deeply rooted banking pedagogy that denied students their voices. Orwell's own conscientisation is evident in this essay and his voice regained resonates till this day.

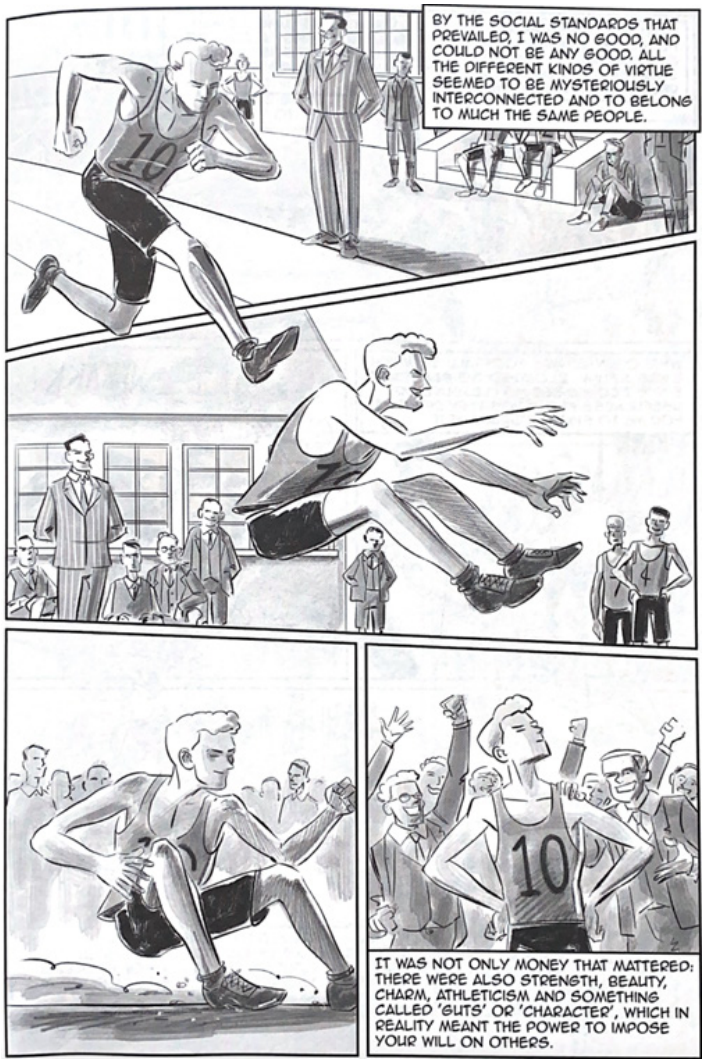

Figure 4: pp. 87-88.

> By the social standards that prevailed (*about me*), I was no good, and could not be any good. But all the different kinds of virtue seemed to be mysteriously interconnected and to belong to much the same people. It was not only money that mattered: there were also strength, beauty, charm, athleticism and something called 'guts' or 'character', which in reality meant the power to impose your will on others. I did not possess any of these qualities (Orwell, 1952).

The book: Dead Poets Society meets Harry Potter?

Very quickly into the book, Mr Keating (Robin Williams) was screaming a barbaric yelp in my mind. I remember my school had arranged for all Secondary Three students to watch Dead Poets Society, going as far as hiring the entire screening hall in the cinema. That also happened to be the year I came to know George Orwell, the name, because we read Animal Farm for English Literature. As I write this, I still cannot figure out what the English department was thinking. Did they think that we would be inspired by the movie to score distinctions in the literature examination? Whilst their intention escapes me, the irony could not, even if it wanted to. I saw so much of my school in Welton Academy and concluded that I was stuck in a reincarnation of the Animal

Farm. It is no coincidence that Beasts of England can be sung to the melody of our school song. You could say my crusade for emancipation began at 15.

I do not believe that my generation fantasised about attending boarding school because "Hellton" hardly came across as appealing. Hogwarts though is a totally different story for the later generations. How many grew up wishing they could run into the wall at platform nine and three-quarters? Perhaps this graphic novel by Wilson and Huxtable might help redress the imbalance, especially if it gets made into a movie! The storyboard has already been completed and characters fleshed out by Huxtable's beautiful illustrations; without which, I do not believe I would have connected with Orwell's original words as vividly. It does make me wonder if Leith would have had more sympathy for young Eric Arthur Blair had he read this book instead of the essay. The screenplay is nearly complete too though Wilson may have a tad more to do. He set out to stay true to Orwell's essay hence his very judicious adaptation. For the silver screen, he might unleash a little bit more of his own creativity. One last thing… Warner Bros, Disney, Universal, are you reading this?

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Fernando M. R., & Francisco, J. M. (Eds., 2022). University and school collaborations during a pandemic. Sustaining educational opportunity and reinventing education.

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During a time of crisis, the reactions and decision-making processes of global education institutions will naturally come under scrutiny (Hodges et al., 2020). The pandemic had drastically altered the manner education institutions operate, create new programmes, develop contingency plans during crises, and most crucially, perceive education itself (Rudolph et al., 2021). The outbreak of the COVID-19 pandemic was an unprecedented crisis and the world witnessed the adaptability and resilience of many education institutions and societies in different parts of the world (Tan et al., 2022). The significance of this book lies in its argument about how universities are organic and flexible in their approaches which characterised their responses to mitigate and manage the impact of the pandemic. It highlights the crucial role of universities in supporting and sustaining educational opportunities in very difficult circumstances and brings to attention the crucial role of research and innovation in these universities.

In their book, the editors integrated the contributions of various authors from different higher education institutions around the globe to observe their response to the COVID-19 pandemic, in particular, with an acute analysis of their continuity approaches and processes. This book reveals that despite the serious challenges brought about by the pandemic, universities have been able to successfully sustain educational standards and opportunities. To achieve this, universities have had to capitalise on their research capacities and outreach capabilities to develop sustainable solutions to mitigate the effects of the pandemic. Despite being labelled, albeit inaccurately, as 'ivory towers' (p. 336) – institutions detached from the realities of societal challenges and everyday problems – the universities have been able to shape positive futures by creating 'open systems' (p.12) and forging relationships with communities through innovative solutions.

In the first chapter, the editors – Fernando Reimers (an expert in the field of global education) and Francisco Marmolejo (the higher education president at Qatar Foundation (QF), where he leads the support and coordination activities of eight universities in Qatar) – found that universities were able to not only develop useful and innovative solutions to sustain educational opportunity and to improve them, but as a result of this innovation, they were able to enhance internal university processes. Using a survey administered to the leaders of 101 universities and 20 in-depth case-studies, the editors weaved together the reactions and initiatives of a network of different types of educational institutions (a mix of public and private institutions) in different parts of the world, including Qatar, Spain, Turkey, and Vietnam, into a coherent whole (see section 1.5). Reimers and Marmolejo found that universities engaged schools and saw this as part of their mission to 'advance knowledge' and 'support the integration of teaching and learning efforts' across different institutions (p. 31). The results of the survey highlighted the evolving role of universities in supporting schools within the community and demonstrated their capacity to respond to a global crisis.

The case-study presented in the second chapter illustrated how Fundação Getulio Vargas (FGV) schools in Brazil created a digital education tool, consisting of online content and teaching materials, to create online programmes and guide policy makers to improve Brazil's Basic Education system. What is important here is that this digital tool was not only helpful to provide basic education to schools during the pandemic, but it improved efforts to build more innovative structures for learning in Brazil, one of the poorest performers in PISA, whose education systems will likely deteriorate even further from the effects of the pandemic. The next chapter (3) presents the case of another institution in South America, Pontificia Universidad Catolica de Chile. Similarly, this case-study also highlighted the importance of collaboration among Chilean universities to respond to the emerging needs of schools in the wake of the pandemic and support school continuity.

Chapter 4 discusses a case of another successful collaboration in Chile between the Centre for Advanced Research in Education from the University of Chile and Andalien Sur Local Public Education service. The initiative for the collaboration was originally intended to prevent school exclusion before the pandemic but was instead redesigned and adapted for the same purpose during the pandemic which exacerbated the problem of school exclusion. Similarly in Colombia, it is

reported in Chapter 6 that EAFIT University worked closely with the Ministry of Education in Colombia to guide the provision of education at the provincial and municipal level.

As discussed in the third chapter about the far-reaching benefits of collaboration, Chapter 5 examines how two programs by Tsinghua University (China) were able to create an immersive learning experience for students who were unable to attend school physically due to the challenges created by the pandemic with far reaching benefits. Two outstanding benefits of the program were firstly, the new content students had access to and secondly, students from remote areas and diverse backgrounds could now form online communities facilitating peer learning which allowed for learning continuity even after the pandemic.

In Symbiosis International University in Pune, India, the university successfully transitioned into a virtual learning and teaching environment during the pandemic, and assisted eight elementary and secondary schools in both urban and rural areas. This collaboration established active partnerships with parents and teachers and this proactive approach has raised expectations and encouraged schools to improve the quality of their delivery. However, this case study also points out three challenges associated with the transition of education to online platforms. It highlights that first, the entire process is dependent on technological access and support and as such, rural students who usually do enjoy stable connectivity and suffer from poorer bandwidth caused a disruption in their access to the learning resources. Second, parents of students in urban areas expressed concern about the increased screen time students experienced during the pandemic. Finally, it highlights the deterioration of students' social development due to the increase in online interactions, thus reducing the time spent to develop social skills.

These disadvantages were also observed in the case of Benemérita Universidad Autónoma de Puebla (BUAP) in Mexico in Chapter 9. This institution, a guide of social and economic development in the state of Puebla, is crucial for moving education from schools to homes where access to education and connectivity is a challenge for at least half the population. In Mexico, education has a significant influence on social mobility, poverty reduction, sustainable development, innovation, and care for the environment (Mundial Banco, 2020; Saavedra, 2020) and in this case, BUAP could play a vital role in establishing continuity for students.

It is also described in Chapter 10 how the Flexible-digital Model (FDM) developed by Tecnologico de Monterrey University supported academic continuity using the FDM and Education 4.0 concepts through a combination of ICT resources (e.g., Artificial Intelligence, data analytics and assistant robots) and innovative learning methods such as problem-based learning and the flipped classroom approach. Similarly, in Chapter 11, another university in Guadalajara, Mexico, found that the pandemic exacerbated the pressing challenges they faced even before the Covid-19 crisis. One pronounced need was that the institution had to work on improving learning outcomes and improve the coherence of the academic transition between higher education and preparatory schools.

Chapter 8 explains how collaborations and establishing initiatives to embrace digital technology before the pandemic were instrumental in the case of the Japanese government and Keio University's paving the way for K-12 education to embrace distance learning through the use of digital platforms. Keio University has been heavily involved in the revision of educational ICT policies in Japan for many years. In Japan, universities have been accumulating knowledge to develop ICT policies and practices and this greatly contributed to the operational readiness of the transition of public education to online platforms. It must be noted that implementation of these networks was greatly facilitated due to the availability of digital networks in Japan and its operational readiness to transit into online learning and teaching (Nae, 2020).

In chapter 12, a university in Morocco, Al-Akhawayn University, adopted several social roles during the pandemic to alleviate poverty and address exclusion especially in the education of K-12 students. One innovative project by the university was the distribution of 1,000,000 tablets to students in public schools across the country, all loaded with educational content to act as virtual schools during the pandemic. In addition, Al-Akhawayn University was also involved in the crowdsourced production of children's stories. This program was intended to encourage reading and education skills for children to promote research on Arabic language, literature and culture.

In Chapter 18, the case of the Faculty of Educational Science of Bahcesehir in Turkey also highlighted the support the institution provided to K-12 teachers in terms of digital literacy and integration of technology while providing psychology support for parents to develop their resilience. Chapter 19 similarly reports how Arizona State University successfully moved their classes online and disseminated elementary and secondary educational resources to create hybrid learning opportunities for students at the different levels. It is noteworthy that the intention here, similar to cases mentioned earlier, was to help local communities achieve continuity with access to education, improving student outcomes and also the quality of their lives.

Chapter 13 highlights how the Covid-19 pandemic created new ways of doing and being in education systems across the globe. The people in Aotearoa, New Zealand, focused on saving lives as opposed to sustaining an open economy during the pandemic. Massey University worked with the New Zealand Ministry of Education to support educators to learn how the teaching of Mathematics can help learners during the lockdown. This process led to a journey of discovery among teachers where there was a clear focus on wellbeing and not merely the provision of education due to the development and strengthening of the relationships with communities.

The wellbeing of the community was also highlighted as a mission of the National Research University Higher School of Economics in Russia presented in Chapter 16. The Institute of Education at the University of Lisbon also improved students' learning through innovative practices and teachers' capacity building in Chapter 14. It pointed out how awareness-raising and training activities for 90,000

teachers facilitated effective use of technologies to create more meaningful and engaging activities for the students. Doing this in turn has a reciprocal effect as students become more engaged and motivated to learn even during a crisis. Chapter 21 also highlighted the case of the University of Education in Vietnam which adopted a whole-school approach to provide mental health support for students all over the country. The efforts here were based on Eppler-Wollf et al.'s (2019) School-Based Mental Health Collaboration 'grounded in mentalization theory and practice' (p. 322). This effort highlighted the importance of the effective use of resources and distribution of education materials and also the role of long-term contingency planning.

The Qatar Foundation (QF) played a key role in the development of Qatar through education and community development. Chapter 15 examines how the QF created coordinated efforts between Higher Education and Pre-University Education to facilitate educational continuity during the pandemic across institutions within the foundation and beyond. QF also organized a series of virtual global conferences to discuss the impact of Covid-19 on education and inform policymakers on post-crisis education. Chapter 17 presents the case of how students in university Camilo Jose Cela, Spain, participated as teaching assistants to support primary and secondary school teachers. Learning and reflection took place in unexpected moments integrating the strengths of different members of the community and the success of this program hinged on three specific principles: (1) innovation and entrepreneurship, (2) digital transformation, and (3) social commitment.

The Massachusetts Institute of Technology (MIT), a world class institution in the USA cemented its commitment to advancing knowledge and educating students in science, mathematics and technology to serve the world in the twenty-first century as explained in Chapter 20. MIT established the Full STEAM Ahead into Summer (FSAIS), an online summer program, with the aim of improving remote collaborative learning experiences through developing and sharing a curriculum that encourages 'a minds-on and hands-on approach' (p. 299) for K-12 students. This approach, leveraged on current structures and projects within MIT, and the development of collaborative partnerships with the local and international community.

The book concludes with a broad analysis across all the case-studies and this analysis revealed that universities play a core role in the education ecosystem working with schools and communities to ensure education continuity. One highlight in the concluding chapter is the summary of the innovations and evolutionary processes which have emerged from the universities' responses to the pandemic, Several pertinent areas of research such as the role of digital learning, the impact of inequality on education and also that of implementing wellbeing initiatives, particularly in a crisis, and the importance of acquiring a breath of different skillsets including digital literacy ought to be considered and looked into carefully. A better future could be shaped through a gradual transitioning of effective and practical solutions, employing prudent economic policies, and encouraging sustainable development in core industries (Kolodko, 2020).

While dealing with and emerging out of this pandemic, what is going to remain is how these networks support, mentor, and evolve in the process. One quality that stood out in all the case studies in this book is the resilience and positive engagement of higher education institutions and the communities they are in. Most institutions focused on providing continuity through provisions of technological support and the transitioning of educational materials to online platforms. The support also included training for teachers and other stakeholders within the system such as parents and school administrators. It is clear that encouraging research and innovation and promoting synergies between research, teaching and outreach efforts are vital in advancing and sustaining support structures to deal with disruption and ensure continuity and sustainability during a crisis.

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Shelley, A. (2021). *Becoming Adaptable. Creative facilitation to develop yourself and transform cultures*. Intelligent Answers.

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Arthur Shelley is a well-known Australian knowledge management guru. Shelley has a wealth of industry and adult education and training experience: for instance, he was the Global Knowledge Director of Cadbury Schweppes and he has collaborated with organisations as diverse as NASA, Cirque Du Soleil, governments, universities and start-ups. Becoming Adaptable is Shelley's fourth book and it builds on his previous ones: *The organizational zoo: A survival guide to workplace behavior* (2007), *Being a successful knowledge leader: What knowledge leaders need to know to make a difference* (2009) and *KNOWledge SUCCESSion: Sustained performance and capability growth through strategic knowledge projects* (2017). *Becoming adaptable* is relevant not only to adult educators and learning facilitators, but also for (higher education) teachers and students, leaders, coaches, and mentors – in fact, for anybody who sees the need to become more adaptable in our VUCA (volatile, uncertain, complex and ambiguous) world. In other words, the book is of general interest. The "ability to adapt to change" is also how Stephen Hawking defines intelligence (cited in p. 58).

At the outset of his latest book, Shelley asks how we can remain adaptable over time, both in our professional and personal lives. Practicing adaptability is rather useful as it may help us in expanding our comfort zone, building resilience, accelerating our performance and reducing our anxiety. Shelley argues that adaptability must not be perceived as merely remedial and reactive, but it is best used as a proactive preparation for change. Change can be a well-disguised opportunity that we can leverage and create value from.

For the reader who is new to Shelley's work, it is useful to briefly introduce Shelley's concept of the organizational zoo that he has been refining for the past two decades. This is an entertaining, and at the same time, very thoughtful 'zoology'. The 'zoo' mostly referring to the workplace, but also to our home, clubs and associations. An organization's culture is dependent on the balance of the behaviours typically associated with various characters. A positive zoo is welcoming, friendly diverse, open, inspiring, playful,

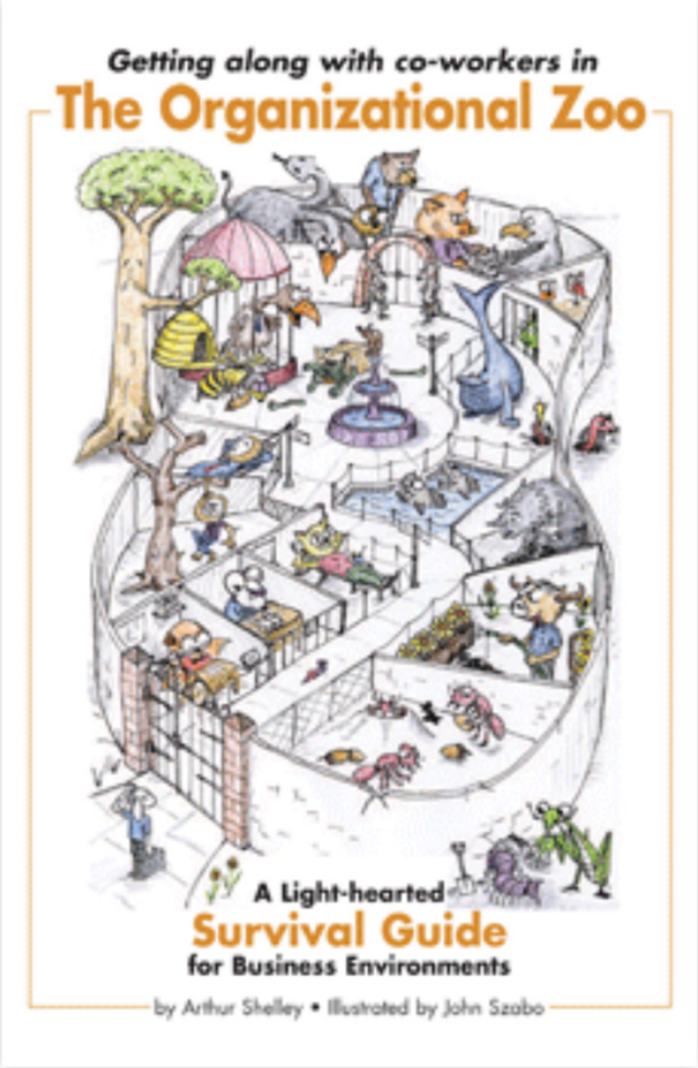

Figure 1: Shelley (2007).

pleasant, productive, respected, balanced, social, stimulating. In contrast, a negative zoo is political, negative, territorial, backward, divisive, frustrating, change-averse, manipulative, nasty, procrastinating, dangerous, draining.

Cleverly, there are characters for all letters of the English alphabet. It is not a bestiary in the strict sense of the word, as a plant (Quercus robur), as well as extinct (triceratops) and imaginary creatures (unicorn and xbreed) are included. It comprises ants, bees, chameleons, dogs, eagles, felines, gibbons, hyenas, insects (two types: pestiferous and beneficial), jackals, kids, lions, mice, nematodes (elongated, cylindrical worms that helps distribute bacteria and fungi – in Shelley's words: lazy parasites), owls, piranhas, Quercus robur (oak trees, described by Shelley as endangered philanthropic chairpersons), rattlesnakes, triceratops (a large quadrupedal herbivorous dinosaur, who in Shelley's words, is battle-scared), unicorns, vultures, whales, xbreeds (multi-talented hybrids in Shelley's terminology) and yaks. Z is reserved for zoo. There are organizational zoo cards (see below) where each character is described by strong, easily observable features and words that are not typical for it. To give an example, the lion is described as an aggressive leader that rules the pride through fear. In Shelley's conceptualization, the lion is aggressive, controlling, powerful, self-interested, strong, territorial and not cautious, dedicated, hardworking, patient, shy and tolerant.

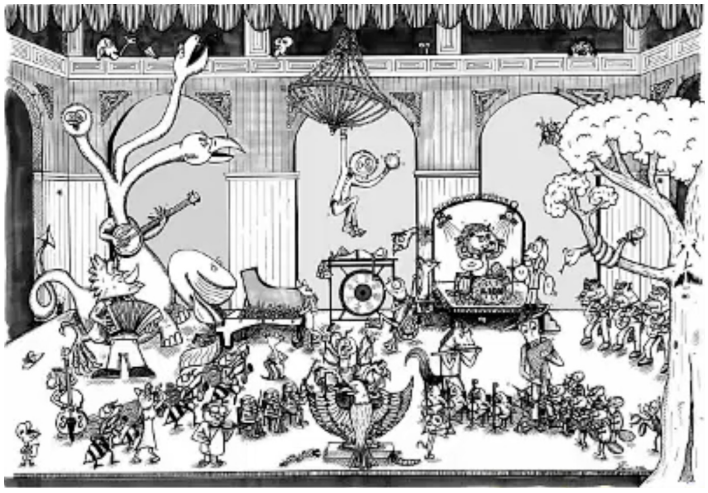

Figure 2: A depiction of an organizational zoo. Source: partial screenshot from Shelley (2020b).

The author cautions that to pose the question "Which character am I?" would be misinformed. Instead we should ask: "Which is best to be here and now?" (p. 104). Moreover, the character cards do not represent people, they are metaphors for behaviours. Shelley's intention for creating the organizational zoo set of metaphorical characters is to represent recognizable behavioural characteristics in humans that help us to further develop our understanding of human interactions and relationships, amongst other intended learning outcomes. Becoming Adaptable further develops the metaphorical realm first created in The Organizational Zoo (2007) into a series of advanced behavioural development activities that can be facilitated to build trust and strengthen relationships. In addition to his books, the author has created character cards that can be used as a resource for gamification in workshops for personal and professional development and also for mentoring, coaching and self-development. Intended learning outcomes include: an improved understanding of colleagues' behaviours, the reduction of conflict, an improvement of an organisational climate and an injection of humour in an organisational culture. Hereby, Shelley highlights the benefits of diversity and recommends to build teams with a productive mix of behaviours.

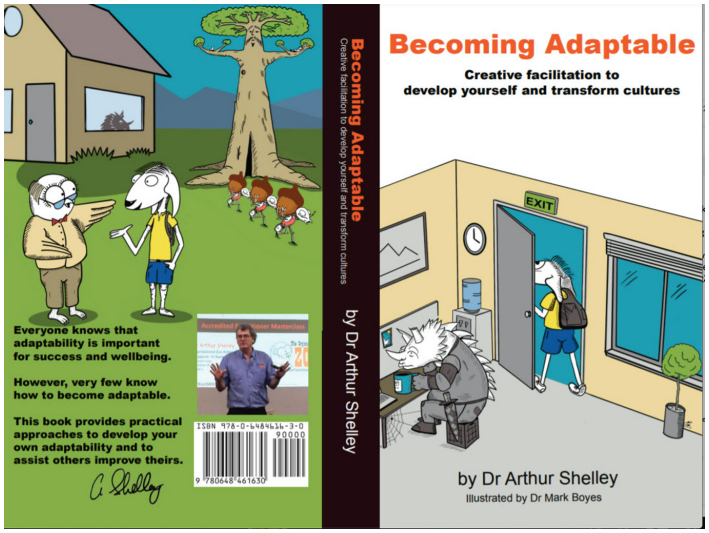

Figure 3: Front and back cover of *Becoming adaptable*.

Becoming adaptable is around 300 pages long and contains illustrations by Mark Boyes. The book is divided into four main parts: (A) "Understanding the power of adaptability", (B) "How to start becoming adaptable", (C) "Theories and philosophies behind this approach", and (D) "Start becoming adaptable for YOU". The four parts are split into a total of 14 chapters and there is a useful appendix with 70 concepts deemed useful to facilitators. The book also includes pre-publication praise, acknowledgements and references. Moreover, there are 12 case studies, termed "success stories", that share applications of Shelley's approach in a wide variety of different contexts. Members of Shelley's Organizational Zoo Ambassadors Network (OZAN) contribute examples from diverse countries such as Thailand, Hong Kong and Switzerland. They include diversity workshops with participants from different countries, different organisational examples (from banks to universities) and perhaps most touchingly, the example of an autistic boy (pp. 249-251).

The five chapters of Part A ask the following key questions: Why is behavioural adaptability important? Who becomes adaptable? What is achieved by being adaptable? When should we facilitate adaptability development? And: "Where does behavioural adaptability apply to success?" (p. 73). Shelley believes that it is precisely these "questions – why, who, what, when and where – [that] will guide you towards success in almost any endeavour" (p. 61). There is an optimal order of these questions in designing initiatives and they are linked to tools, process, people, value and desired outcomes. Strong themes throughout Shelley's book are that "everything in life is a learning process" (p. 63) and "the importance of creating an engaging environment for people to interact with each other in a constructive manner" (p. 55). Shelley himself highlights that the latter is consistent with other approaches such as "Agile, design thinking, student-centred learning, complex problem-solving, cocreation, and distributed leadership" (p. 55).

Part B of the book is about how to start becoming (more) adaptable. This part is divided in chapters about the facilitation of interactions with positive impact (chapter 6), many diverse examples of facilitation activities (chapter 7) and tools for efficiency and effectiveness (chapter 8). Shelley advocates an interactive approach to facilitation, education and training. Such an approach is quite common these days, especially in facilitation and training, and increasingly also in education. Although relatively method-agnostic, Shelley has developed a particular method which he calls "Conversations That Matter". This method has five key elements:

1. "Purpose: what am I trying to achieve?
2. Outputs: tangible artefacts and results generated.
3. Outcomes: intangible impacts generated.
4. Benefits: value created by the interactions, outputs and outcomes.
5. Beneficiaries: who receives these benefits?" (p. 111)"

A mere transfer of knowledge is insufficient, the most powerful facilitation leads to the further development of participants' metacognitive and social abilities. Helpfully, Shelley's Organizational Zoo website (http://www.organizationalzoo.com/zootube/) provides some short video guides to some of his techniques.

A highlight of chapter 6 is the discussion of the Reverse Bloom Learning Framework that the author had already discussed in an earlier work (Shelley, 2020a). Many readers would be familiar with Benjamin Bloom's taxonomy of educational objectives or a variation (such as the one by Anderson) of it. These taxonomies are supposed to be part of the basic knowledge of K-12 and higher education teachers and they can be linked to teaching and learning activities as well as assessments. The Reverse Bloom Learning Framework is hence immediately counter-intuitive, though I do not think that it is Shelley's intention to prove Bloom and followers wrong. His approach is to start with the co-creation of insights through inclusive conversations that leads to the synthesis of options that can be prioritised for action and eventually applied, generating new knowledge. It is creative and counter-intuitive ideas like this that question gospel truths that make Shelley's book a very worthwhile read.

Part C is entitled "Theories and philosophies behind this approach". There are chapters on The Organizational Zoo (chapter 9), theories embedded in the organizational zoo (chapter 10) and "MindFLEX – the complexity of parallel perspective facilitation" (chapter 11). In chapter 9, Shelley shares the impressive applications of the organizational zoo concepts in some 20 countries through a small international community, called OrgZoo Ambassador Network (OZAN). In chapter 11, "mindFLEX" is differentiated from "mindSET" (p. 219). It describes a facilitator's "ability to hold multiple perspectives in mind in parallel" (p. 220) and enables them to more richly engage participants in activities.

The final main part of the book is entitled "Start becoming adaptable for YOU". It is divided into three chapters: behaviour can be an asset or a liability (chapter 12), your journey of becoming (chapter 13) and lifestyle learning and value generation for others (chapter 14). In conclusion, Shelley proposes to challenge ourselves and consider taking up leadership roles.

I like Arthur Shelley's humility. Already the first sentence of the preface is: "We are all on a journey of becoming" (p. 12). This stance of a highly experienced and accomplished expert is, for instance, also present in the titles of two books by Stephen Brookfield: *Becoming a critically reflective teacher* (2017) and *Becoming a white anti-racist* (2021). Also, Shelley's metaphorical language of the organizational zoo is attractive to me. It reminds me of George Orwell's advice to never use "metaphors… that you are used to seeing in print" (1945, p. 19). Orwell also warned that "there is a huge dump of worn-out metaphors which have lost all evocative power and are merely used because they save people the trouble of inventing phrases for themselves" (p. 5). In inventing a whole new microcosm, Shelley has taken the trouble to come up with fresh and new metaphors while studiously avoiding the use of overly technical language.

Shelley also shows much cultural awareness and sensitivity. The parallel publication of a second edition of his *The organizational zoo* (2007) in 2021 is to be welcomed, as it provides a useful companion volume to Becoming Adaptable. The tone of the book is decidedly conversational and less academic. Although there are very useful references, an academically-inclined reader may have asked for more of them.

I have had the great pleasure to experience Arthur Shelley's excellent facilitation skills first-hand both face-to-face and online on two occasions over the last couple of years. Although I was familiar with some of his work (Shelley & Goodwin, 2018; Shelley, 2020a), reading *Becoming Adaptable* made me even more interested in his thoughts and practice. I highly recommend reading Becoming adaptable in conjunction with The organisational zoo and the web resources available at The Organizational Zoo website.

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Stephen D. Brookfield & Mary E. Hess (2021). *Becoming a white antiracist. A practical guide for educators, leaders and activists*. Stylus Publishing.

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Having had the honour and pleasure of interviewing Stephen Brookfield on various occasions (see Brookfield et al., 2019, 2022) and having read much of his impressive body of work, I was thrilled to read his latest – and 20th – book, *Becoming a white antiracist* (co-authored with Mary Hess). Unsurprisingly, it made for thought-provoking and inspiring reading. Brookfield and Hess are not just deep thinkers about race and racism, they also have decades of experience as facilitators of workshops and antiracist activists. Having become increasingly aware about his own 'race-blindness', Brookfield started to study the topic extensively during a self-imposed silence on race (in terms of publishing) that lasted a decade. Since 2003, he began to write about race, especially in the context of higher education. I reviewed his excellent *Teaching race. How to help students unmask and challenge racism* (Brookfield & Associates, 2018) in this journal (Rudolph, 2020); and *Becoming a white antiracist* can be considered a companion piece to *Teaching race*.

A brief introduction of the book's authors is in order. Brookfield's distinguished co-author is Mary Hess, a professor of educational leadership at Luther Seminary who has worked with Brookfield before (leading to *Teaching reflectively in theological contexts*). Stephen Brookfield is a Distinguished Scholar at Antioch University, adjunct professor at Teachers College, Columbia University, and Professor Emeritus at the University of St. Thomas (St. Paul, Minnesota).

The title of *Becoming a white antiracist* reminds me of the first book by Brookfield that I read – *Becoming a critically reflective teacher* (2017). I previously commented on the author's reflective humility in that book: that after fifty years of teaching, Brookfield still perceives himself as forever *becoming* a critically reflective teacher (Rudolph, 2019). 'Becoming' in Brookfield and Hess's latest book title is meant to be understood in a similar way. As white people, "we are always *becoming* antiracist, never quite there" (p. 27). The book was written during the turbulent years of 2019 and 2020 that witnessed "catastrophic climate change, a global pandemic and economic collapse" (p. 13). However, to Brookfield and Hess, "the most significant upheavals were those around racial justice":

> "We were inspired by the Black Lives Matter movement, outraged by the growth of anti-Blackness in the United States, and staggered by the way it became legal to tear immigrant families apart at the U.S. border and imprison children like animals in cages. Each week brought further instances of the slaughter of people of color and the demonization of anyone not of white European descent" (p. 13).

To the authors, "*race, especially anti-Blackness, is the biggest unaddressed problem in the United States*" (p. 86, emphasis in original), and "*race is really a problem of white people*" (p. 14, emphasis in original). Books like *Becoming a white antiracist* are needed to help white people think about their – often unacknowledged – white *racial* identity and develop an antiracist white identity. The authors argue against the myth of the 'good white people' (Sullivan, 2014) and reconstruct how white supremacy benefits white people and has inserted itself into their consciousness.

The book fulfils multiple purposes. It is meant to be a practical guide for educators, leaders and activists rather than a theoretical piece of work. However, the book is also strong on theory. This is no surprise, as Brookfield is the author of *The power of critical theory for adult learning and teaching* (2004), an impressive tour de force of the critical theory of the main proponents of the Frankfurt School, that substantially expands the scope of traditional critical theory by incorporating Foucault, feminist and critical race theories into a powerfully enhanced theory. One major achievement of *Becoming a white antiracist* is that it compiles fantastic resources that are not limited to the extensive bibliography, but also documentaries, films, memes, social media, podcasts, videos, songs, museums and journalistic resources that are relevant to the topic. There are nine brief video conversations between the authors about major themes from the book that are freely available on YouTube (https://www.youtube.com/playlist?list=PLmIdOEBI8dr7QPOWCLGoOeOPSS_iOPHzY). There are also many excellent recommendations of historical books on race and a compelling critique of structural patterns in the vast majority of films out of the predominantly white and male Hollywood film industry:

> "The problem is that these represent people of color as being caught in the systems of domination from which they must be rescued by 'good' white people… the hidden 'trick' of these films is to center the experience of a white character, drawing the viewer into once again making whiteness the normative focal point, and subtly nudging viewers toward a view of such liberation as individually produced by a 'white savior'" (p. 79).

Chapter 1 discusses why white antiracism is needed. The authors argue that white people need to understand their collusion in, and enactment of, white supremacy. Like in Brookfield and Associates' *Teaching race* (2018), the term 'white supremacy' is not associated "with the KKK, lynching, cross burning and angry white men carrying Tikki torches, white nationalist militias 'policing' Black Lives Matter demonstrations" (p. 32) or other extreme and violent manifestations in white nationalist groups. The authors use it as referring to the "broadly accepted idea of innate white superiority and the way that outlook legitimizes the continued existence of massive racial disparities" (p. 22). In the authors' usage, white supremacy is about "ensuring that the structural dominance of white people is viewed as unremarkable, normal, and correct" (p. 33).

Racism and white supremacy in the U.S. manifest themselves as de facto resegregation and the school-to-prison pipeline. Chapter 1 contains the following powerful and depressing passage:

> [R]edlining mortgage policies ensure that people of color cannot get loans to purchase property in areas that are predominantly white. People of color live in the poorest areas where property taxes are insufficient to fund good schools and proper health care. The higher levels of education correlated with professional jobs are thus closed off, meaning that minimum wage jobs in the service economy are disproportionately filled by people of color. When people of color find themselves in supposedly integrated public schools, the racist stereotype that they are less academic and less intelligent ensures a de facto resegregation, whereby they are much more likely to be automatically placed in groups, classes, and streams that have low academic expectations. Environmental law allows for the dumping of toxic waste in poor areas that are inhabited disproportionately by people of color. The securing in the public mind of the innate criminality of black, brown, and indigenous people means that they are then targeted for arrest and conviction, resulting in the school-to-prison pipeline" (p. 21).

In the U.S., incarceration rates for Black and brown people are astonishingly disproportionate. People of colour are shot by white policemen with depressing regularity. Immigrants are frequently demonised as 'terrorists', 'criminals' and 'rapists'. Given the above, the idea of an equal opportunity seems absurd and can only be maintained by "ideological manipulation" (p. 50).

Chapter 1 is a key section of the book and it makes two more crucial points. First, white people should not only confront racism because it is morally wrong, but also because it is in their own interest, as it helps them preserve their mental health. There are innumerable instances that show over and over again that the concept of white supremacy is fallacious. Thus, maintaining such a counter-factual stance leads to permanent cognitive dissonance. Second, racism is best conceptualized as systemic and structural – securing the continued hegemony of the dominant racial group – rather than an individual prejudice. A key reason why racism is such a difficult topic to discuss is because emotions often fly high. Viewing it as systemic makes it easier to start a conversation.

Chapter 2 clarifies what constitutes a white antiracist identity and also introduces the concept of brave (versus safe) space. Many whites in the U.S. and elsewhere are unaware that whiteness is a "particular racial identity" (p. 28). Whiteness "is conceptualized as the universal and higher end of human development" (p. 28). The idea of whiteness helped justify slavery, as the enslaved were 'subhuman' and 'like animals', an idea that – usually in more subtle forms – lives on in contemporary racism. This idea informed how Christians of all denominations justified slavery. In the history of the U.S., slavery has played an important economic role that has aided in creating the huge economic disparities between people of colour and whites. Whiteness is associated with a structured advantage that has been created through a long history of exclusion and subordination. In that context, the *structural* racism of white people in countries like the USA is quite inevitable. This chapter also makes the critically important point that 'race' as a biologically-determined category that claims mythical innate genetic 'racial differences' is nothing but an illusion. For instance, "the DNA of white Europeans and Black Africans differs in no significantly discernible way" (p. 124). While race is not real and a social construction, it is racism that is very real.

Chapter 3 goes into more detail what it means to be white and argues against a 'colourblind' view of the world. In this context, the term 'white privilege' is helpful. It refers to the absence of the consequences of racism or in other words, the non-existence of penalties that are incurred as a result of somebody's skin colour or phenotype. White privilege means a lack of structural discrimination, not being regarded 'as less' (than white people).

In chapter 4, Brookfield and Hess present a template of how to help white people become aware of their racial identity. They argue that an "antiracist white identity has to be an activist one" (p. 65). In this context, the extremely useful concept of intersectionality is also introduced. In addition to race, intersectionality encompasses considerations of class, gender, sexual orientation and ability. Chapter 5 discusses and exemplifies the use of personal stories and digital narratives in uncovering racism.

Chapter 6 aims to help white people embrace the discomfort of 'race talk' and examine their own white supremacy. The desire of whites to cling on to the self-identification as 'good white people' is what DiAngelo (2018) called 'white fragility' whereby one's emotional equanimity is of foremost concern. Many whites would consider being called a racist

as one of the worst things that could happen to them, due to racism being associated with hate speech and violence against people of colour. When white people realise that they have benefited from racism and that they have been perpetuating it, often in unconscious ways, they usually experience discomfort that can manifest itself in guilt, shame or other powerful emotions. These emotions can be a powerful catalyst for personal transformation.

In the next chapter (7), the authors share their vast knowledge how to run discussions about race. They revisit some of Brookfield's powerful discussion protocols that act as interactive devices: backchannel chat (for instance, via Sli.do), Circle of Voices, Chalk Talk, Circular Response, Bohmian Dialogue and Appreciative Pause. These fabulous discussion and engagement techniques (that I have started to use in my own classes and workshops) have been described in other books by Brookfield (especially: Brookfield & Preskill, 2012; 2016).

In chapter 8, activities such as the white privilege walk and the deconstruction of personal stories are proposed to help us think structurally. Sociologist C. Wright Mills (2000 [1959]) wrote already more than 60 years ago that our private troubles (like getting fired) are always connected to public issues (like the growth of monopoly capitalism). Adopting such systemic thinking takes practice and time.

Chapter 9 is about how teachers and leaders can exercise their own power in a responsible, ethical, and effective manner. This chapter's topic is incidentally closely related to the interview that Brookfield gave us for this issue as well as two other books of his. *The power of critical theory* (2004) is the theoretical part, whereas *Powerful techniques for teaching in lifelong learning* (2013) is the applied, practical part of Brookfield's magisterial reflections on power in and outside the classroom. In the authors' view, it is impossible to be nonracist for whites, but they can be antiracist. This apparent paradox is easily resolved as the inability to be nonracist refers to the kind of depersonalised racism that involves learned ideas and behaviours that have become internalized while growing up. The authors usefully emphasise that the inability to be nonracist as a white person does not constitute a crime and white people "should not feel embarrassed about who they are" (p. 157). If one wants to effect lasting change and transform the power structures in academic institutions, much would need to be addressed: "Hiring policies, reward systems for staff and faculty, admission procedures, the composition of boards of trustees, formats of evaluating learning – all these must place recognizing and challenging racism at their center" (p. 155).

The next chapter (10) is intended to demonstrate how we can draw on the history of antiracist work in becoming an antiracist white. During Trump's presidency, there were efforts to rewrite history by controlling the narrative on race. Conservative U.S. lawmakers have sought to ban or restrict Critical Race Theory from primary and secondary schools in states like Idaho, Iowa, Oklahoma, Tennessee and Texas. Ex-president Trump felt a need to counter the assertion "that America is a wicked and racist nation" and his National Economic Council director Larry Kudlow "didn't believe that systemic racism existed in the United States" (both cited in p. 168). The authors make references to some fantastic historical resources that counter revisionist historical narratives that attempt to silence discussions of racism, equality, social justice, and the history of race. It is intriguing how politicised history education is in the U.S. There is obviously a political interest that kids do not read things like the following quote by Robin DiAngelo (2018, p. ix) in their history textbooks:

> [T]he nation began with the attempted genocide of Indigenous people and the theft of their land. American wealth was built on the labor of kidnapped and enslaved Africans and their descendants. Women were denied the right to vote until 1920, and black women were denied access to that right until 1964.

A passage about legal decisions in the U.S. about people of Mexican descent reveals the absurdity of whiteness and race discourses and made me laugh out loud: legal decisions in the U.S. "first declared that people of Mexican descent were white, then were not white, and then again were white" (p. 170).

The penultimate chapter (11) advises readers on the need to understand the institutional contexts and provides some do's and don'ts in responding to resistance. A friend of Brookfield is being quoted: "There are two ways you can do antiracist work – imperfectly or not at all" (p. 192). Conducting classes or training about racism is fraught with many more difficulties than those on most other topics, and 'failing well' (to quote Samuel Beckett) is a positive outcome.

The final chapter (12) discusses what it means to be a white ally and what is problematic about that idea. Virtue signaling is "something you do to make yourself feel better" and is otherwise unhelpful; one also needs to watch out for the "white savior stance" and "optical allyship" (p. 193). According to the authors, genuine ally work is bound to be punished sooner or later:

> You won't be fired outright… But your contract will not be renewed or your duties will be changed. One very predictable response to being perceived as a racial troublemaker is for the organization to pile on new duties and responsibilities so that your time for advocacy is reduced" (pp. 210-211).

In conclusion, the authors again highlight the psychological and mental health benefits in becoming a white antiracist: if you are white, it "is your best hope for the future" (p. 212).

Reading Brookfield's and Hess's writings on race have made me think much more about my own racial identity. Whilst I am most attracted to the holistic concept of intersectionality, I understand that when you stress that term too much – for instance, in a workshop – then one runs the risk of race being sidelined at the expense of especially class and gender.

One possible critique of the book is its strong focus on the USA. Of course, this makes sense as Stephen Brookfield (who was born in England) has lived there for the past 40

years and Mary Hess is U.S.-American anyway. However, this raises the question: can the book's content be applied to other countries? My short answer is 'yes'. *Becoming a white antiracist* is applicable to much of the northern hemisphere in a rather direct way. Most other parts of the world were colonised by white settlers at one time or another. Consequently, white supremacy is a global issue. Whilst racism and white supremacy are two different things, they are inextricably entwined in the USA and in Western Europe. However, I do not think Brookfield and Hess are saying that only white people are capable of racism, as racism is a system of exclusion that is also being practiced by other people.

I have much sympathy for the authors' thesis that "race, especially anti-Blackness, is the biggest unaddressed problem in the U.S." (p. 86). The authors do not intend to generalise this thesis beyond the USA. I would agree that for the two countries that I am most familiar with – Germany and Singapore – things are different. The most discomforting truth to me as a German (and to many fellow Germans) is the racism of the Nazis that led to the devastating Second World War, the Holocaust and horrific euthanasia programmes. The Nazis' racism was not so much focused on black and brown people (who they also regarded as 'subhuman'), but more on Jews, Sinti, Roma and East Europeans. Such racism, though usually in a more subtle form, continues to rear its ugly head in contemporary Germany. While German racism is entwined with white supremacy, the Singaporean case is more radically different from the one in the U.S. Singapore, perhaps also due to its remarkable economic success in the postcolonial era, is one of the world's rare well-functioning multi-cultural states. Singaporeans are quite accepting of other races. Although there may still be some white privilege, there have been recent discussions about 'Chinese privilege', with ethnic Chinese being the city-state's dominant majority. There are instances of colourism, where darker-skinned ethnic Malays and Indians are put at a disadvantage, for instance on the job market. This colourism could be related to the white supremacy during British colonial rule.

Becoming a white antiracist is an important book. It has helped me become much clearer about my own take on racism, starting with the racist beliefs and behaviours that I grew up with in West Germany in the 1960s and '70s that I started to contest as a teenager. Prior to reading the authors' works on racism – that also include The handbook of race and adult education (Sheared et al. (Eds.), 2010) – it was largely a personalised concept for me. I was pretty sure that I was a nonracist, 'good white person', being married to a Singapore Chinese woman, having lived in Southeast Asia for three decades and having friends from many different countries and ethnicities. Brookfield's and Hess's writings rightly emphasise the historical, systemic and endemic character of racism and they have significantly altered my perspective. Amongst other things, I am more sensitised when it comes to racial microaggressions. While we cannot fix everything, there are things that are in our control and we can use our sphere of influence to work for a less racist future. Community-building is a key aspect of such efforts. I am an admirer of the authors' excellent writings that I highly recommend. This thoughtful, well-researched and practical book is a must-read especially for white people.

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